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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	**John Chen and Lixiao Wang Yiqun Wang and Albert C. C. Chin**
Application No.:	**09/696378**
Filed:	**October 25, 2000**
For:	**DIMENSIONALLY STABLE BALLOONS**
Examiner:	**Sow-Fun Hon**
Group Art Unit:	**1772**

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P.O. Box 1450
Alexandria, VA 22313-1450

Docket No.: S63.2-9503-US01

REQUEST FOR REINSTATEMENT OF APPEAL AND SUPPLEMENTAL BRIEF ON APPEAL

This Supplemental Appeal Brief is being submitted in response to the Office Action mailed October 8, 2003 in which claims 1-26, 31, 33 and 36 have been rejected. Because the Examiner has issued the latest Office Action with a new grounds of rejection, the Applicants hereby formally request to reinstate the appeal in accordance with MPEP 1208.02 and 37 C.F.R. §1.193(b)(2)(ii).

As required, this supplemental appeal brief contains no new amendments or affidavits and is directed only to the new grounds of rejection as stated in the Office Action mailed October 8, 2003.

Any fees required under §1.17(f) and any required petition for extension of time for filing this brief therefor are dealt with in the accompanying Transmittal of Appeal Brief. This brief is transmitted in triplicate in accordance with 37 C.F.R. §1.192(a).

(1) Real Party in Interest

The application is assigned to SciMed Life Systems, Inc., One SciMed Place, Maple Grove, MN 55311-1566, a Minnesota Corporation and a subsidiary of Boston Scientific Corporation, One Boston Scientific Place, Natick, Massachusetts, 01760-1537, a Delaware Corporation.

(2) Related Appeals and Interferences

No related appeals or interferences are pending.

(3) Status of Claims

Claims 1-26 and 31, 33, 36 are pending in the application. Claims 1-26 and 31, 33 and 36 are reproduced in Appendix A, have been finally rejected and are the subject of this appeal.

4) Status of Amendments

All amendments made to date have been entered.

(5) Summary of the Invention

The present application is generally directed to a stent delivery balloon composed of a micro-composite material which includes a longitudinal fibril structure that is either parallel to the longitudinal axis of the balloon structure, or that is diagonal to the longitudinal axis at the molecular level of the balloon. The orientation of the fibril structure can limit longitudinal expansion of the balloon and allow the balloon to expand radially as desired, but minimally, or not at all in the longitudinal direction if the fibrils are parallel to the balloon axis. When the fibrils are oriented diagonally about the axis, they can limit both longitudinal and radial expansion of the balloon when inflated.

The micro-composite material is made up of a combination of a fibril component, a polymeric balloon material which acts as a matrix, and optionally a compatibilizer material which may act to create a less distinctive phase boundary between the fibril and matrix components, but which does not solubilize the LCP polymer in the matrix at human body temperature.

Although such materials have been employed for catheter *tubing*, such material has not been known for use in the construction of catheter *balloons* which exhibit minimal or no longitudinal growth during balloon expansion but which expands as desired in the radial direction, or that exhibit minimal expansion both in the longitudinal and radial directions.

The invention of claim 1 is directed to a dimensionally stable polymer balloon having a longitudinal axis and composed of a micro-composite material, the micro-composite material including a polymer matrix component and a polymer fibril component distributed in the polymer matrix component, the fibril component having micro-fibers oriented substantially parallel or diagonally to the longitudinal axis of the balloon.

The invention of claim 8 is directed a polymer balloon as in claim 1 wherein the micro-composite material further includes a compatibilizer component.

The invention of claim 9 is directed to a polymer balloon as in claim 8 wherein the compatibilizer is a block copolymer.

The invention of claim 10 is directed to a polymer balloon as in of Claim 8 wherein said compatibilizer is selected from the group consisting of copolyester elastomers, ethylene unsaturated ester copolymers, copolymers of ethylene and a

carboxylic acid or derivative thereof, polyolefins or ethylene-unsaturated ester copolymers grafted with functional monomers, copolymers of ethylene and a carboxylic acid or derivative thereof, terpolymers of ethylene, copolymers of unsaturated esters and carboxylic acids or derivatives thereof, maleic acid grafted styrene/ethylene-butadiene-styrene block copolymers, acrylic elastomers, glycidyl(meth)acrylates, ionomeric copolymers, polyester-polyether block copolymers, and mixtures thereof.

The invention of claim 11 is directed to a polymer balloon as in claim 1 wherein the compatibilizer is an ethylene-maleic anhydride copolymer, an ethylene-methyl acrylate copolymer, an ethylene-methyl acrylate-maleic anhydride terpolymer, an ethylene- methyl acrylate-methacrylic acid terpolymer, an alkyl(meth)acrylate-ethylene-glycidyl(meth)acrylate terpolymer, or a mixture thereof.

The invention of claim 16 is directed to a polymer balloon as in claim 1 wherein the fibril component has a melting point of about 250° C or less.

The invention of claim 17 is directed to a polymer balloon as in claim 1 wherein the fibril component has a melting point of about 150° to about 249° C.

The invention of claim 18 is directed to a polymer balloon as in claim 1 wherein the fibril component has a melting point of about 230° C or less.

The invention of claim 31 is directed to an inflatable medical balloon having a circumference and a longitudinal axis including a semi-compliant matrix having a plurality of individual fiber cores mixed therethrough. The cores are evenly distributed about the circumference of the balloon and are composed of one or more materials which are characterized as being stronger than the matrix material and having a bulk elongation less than the matrix material when the one or more materials are oriented in the direction

of the longitudinal axis, and the matrix material and the core material operatively adhering to one another.

The invention of claim 33 is directed to a medical balloon as in claim 31 that expands less than 5% beyond the pre-inflation state.

(6) Issues

I. Claims 1-7, 14, 24-36 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-6, 9-10 of co-pending Application No. 09/885568.

II. Whether the Examiner erred in rejecting claims 1-7, 12-19, 21, 24-26, 31, 33 and 36 under 35 U.S.C. §103(a) as being obvious over Boretos (US 4,254,774) in view of Zdrahala (US 5,156,785).

III. Whether the Examiner erred in rejecting claims 20 and 22-23 under 35 U.S.C. §103(a) as being unpatentable over Boretos (US 4,254,774) in view of Zdrahala (US 5,156,785) as evidenced by Polymers (A Property Database).

IV. Whether the Examiner erred in rejection claims 8-11 under 35 U.S.C. §103(a) as being unpatentable over Boretos (US 4,254,774) in view of Zdrahala (US 5, 156, 785) as applied to claims 1-7, 12-19, 21, 24-26, 31, 33 and 36 above, and further in view of Heino et al. (US 6,221,962).

(7) Grouping of Claims

For issue I, claims 1-7, 12-15, 19, 21, 24-26 and 36 stand or fall together.

For issue I, claims 16-18 stand or fall together.

For issue I, claim 31 stands or falls alone.

For issue I, claim 33 stands or falls alone.

For issue II, claims 20 and 22-23 stand or fall together.

For issue III, claim 9 stands or falls alone.

For issue III, claims 10-11 stand or fall together.

8) Argument

I. A Terminal Disclaimer which obviates the obviousness-type double patenting rejection of claims 1-7, 14, 24-36 over claims 1-6, 9-10 of co-pending Application No. 09/885568 is enclosed herewith.

II. *The Examiner erred in rejecting claims 1-7, 12-19, 21, 24-26, 31, 33 and 36 under 35 U.S.C. §103(a) as being obvious over Boretos (US 4,254,774) in view of Zdrahala (US 5, 156, 785).*

A. Claims 1-7, 12-15, 19, 21, 24-26 and 36.

Claim 1 is representative. Claim 1 is directed to a dimensionally stable polymer balloon having a longitudinal axis and composed of a micro-composite material, the micro-composite material including a polymer matrix component and a polymer fibril component distributed in the polymer matrix component, the fibril component having micro-fibers oriented substantially parallel or diagonally to the longitudinal axis of the balloon.

In the Office Action mailed October 8, 2003, it is asserted that Boretos teaches a balloon catheter which has a one-piece unitary construction which minimizes the possibility of detachment or separation of portions thereof accidentally in a critical area of the body where harm may be incurred to the patient, such as in the area of the brain or lungs (col. 2, lines 60-70). To form the balloon, the catheter tubing is heated locally in the area where the balloon is desired and then inflated (col. 5, lines 40-70). The Office Action asserts that Boretos teaches that the catheter tubing may comprise any

suitable thermoplastic material such as polyurethanes and copolyester polymers (col. 4, lines 35-45).

It is admitted on page 4, second paragraph of the Office Action mailed October 8, 2003, that Boretos fails to teach the polymer fibril component distributed in the polymer matrix.

Appellants submit that in fact, Boretos fails to teach any type of fiber or other reinforcement structure for the tubing described therein.

The Office Action employs Zdrahala, as the secondary reference. Zdrahala was presented as the secondary reference in the prior rejections which have since been withdrawn, and was discussed at length in the Appeal Brief mailed May 20, 2003. The Office Action asserts that since Zdrahala teaches fiber reinforced catheter tubing having stiffness in the longitudinal direction as well as rotational stiffness and that both may be varied along the length of the tubing, it would have been obvious to one of ordinary skill in the art to have used the fiber reinforcement taught by Zdrahala in the invention of Boretos in order to obtain a balloon catheter with the desired variance in axial and rotational stiffness along its length.

Appellants disagree.

Appellants assert that this combination of references, as with LeVeen et al., US 4,448,195 and Zdrahala, US 5,156,785, the combination presented in the previous rejections, and discussed at length in the Brief on Appeal mailed May 20, 2003, is lacking a most important element of the present claims, i.e. the polymer *balloon* as taught and claimed in the present application. In fact LeVeen et al. at least described reinforced tubing. Boretos fails to teach that either the catheter tubing or the balloon is reinforced.

There is no suggestion whatsoever that reinforced tubing can be post-extrusion processed as required for formation of a successful balloon, in the same or similar manner as employed by Boretos. It is thus our position, that the combination of Boretos and Zdrahala is even less relevant than the combination of LeVeen et al. and Zdrahala which combination has now been abandoned.

Zdrahala, US 5,156,785

Zdrahala describes extruded catheters and other flexible plastic tubing which may be manufactured with improved rotational and/or longitudinal stiffness, compared with catheters made of more conventional plastics. A tubing of liquid crystal polymer plastic-containing material may be extruded through a tube extrusion die while rotating the inner and outer die walls to provide circumferential shear to the extruded tube. Thus the liquid crystal polymer is oriented in a helical manner to provide improved properties, including greater rotational stiffness. (Abstract)

Zdrahala was already discussed at length in the Brief on Appeal filed May 20, 2003 and the decision of the Board was to remand the case, and the rejections based on the combination of LeVeen et al. and Zdrahala were withdrawn. The same arguments can be applied here.

Again, Appellants submit that Zdrahala teaches extruded catheter tubing with LCP polymer fibers in a matrix polymer. Zdrahala *does not* suggest that the LCP polymer fibers in a matrix polymer be employed to form a dilatation balloon. Formation of a balloon requires post-extrusion processing of the tubing, which is not suggested anywhere by Zdrahala.

Zdrahala does teach that the LCP fibers stiffen the extruded tubing in the longitudinal and/or radial direction. The skilled person thus is informed that the LCP fibers can be expected to create at least some difficulty for post extrusion processing steps which invoke radial expansion and often, longitudinal stretching. Zdrahala provides no suggestion that such difficulties can be overcome in a balloon forming process, which requires post extrusion processing. Zdrahala therefore would have led the skilled person away from making a balloon from tubing reinforced with LCP fibers.

Even if a skilled person, looking at Boretos et al. and Zdrahala together, conjure up a vision of a balloon formed at the end of Zdrahala's tubing by Boreto's process, the conjured image would have at most suggested to try to make such a structure. It cannot have been more than obvious-to-try because the combination fails to create an expectation of success in forming a fiber reinforced balloon from fiber reinforced tubing. Neither of these two references provides this necessary teaching, without which the rejection is nothing more than hindsight reconstruction.

No *prima facie* case of obviousness has been made out. The Examiner has employed hindsight reconstruction and even then has only built an obvious-to-try case. Hindsight reconstruction is impermissible and obvious-to-try no obviousness. Consequently, at least for these reasons the rejection of claims 1-7, 12-15, 19, 21, 24-26, 31, 33 and 36 under 35 U.S.C. §103(a) as being unpatentable over Boretos (US 4,254,774) in view of Zdrahala (US 5,156,785) should be reversed.

B. Claims 16-18

Claims 16-18 are patentable over Boretos in view of Zdrahala for at least the reasons that claim 1 is patentable, and also for the reason that the use of low melting point fibril components recited in these claims are not taught or suggested in either document. The following argument was presented in the Brief on Appeal mailed May 20, 2003.

Claim 16 is directed to an embodiment of a polymer balloon in which the fibril component has a melting point of about 250°C or less. Claim 17 is directed to an embodiment in which the polymer balloon includes a fibril component having a melting temperature of about 150°C to about 249°C. Claim 18 is directed to an embodiment in which the polymer balloon includes a fibril component having a melting point of 230°C or less. The use of materials with lower melting temperatures is advantageous because they require lower processing temperatures. Lower processing temperatures are beneficial from a personal safety perspective as well as being less detrimental to polymer properties during processing, and are also more economical.

The liquid crystal polymers disclosed by Zdrahala have melting temperatures which are higher than those embodiments found in claims 16-18. Indeed, Zdrahala does not teach a fibril component having a melting point less than 280°C. For example, VECTRA® B950, disclosed at col. 6, lines 48-49, has a melting point of 280°C.[1] Appellants submit that it is in fact *unusual* for these types of polymers to have melting temperatures of less than 280°C.

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[1] Heino et al., US Patent No. 6,221,962 B1; Baird, US Patent No. 5,834,560

Appellants are also resubmitting in Appendix B, references illustrating that the polymers sold under the tradename of both VECTRA® and XYDAR® generally have higher melting temperatures than those of the fibril component recited in claims 15-18. Appendix B was included with the Brief on Appeal mailed May 20, 2003. There is no new evidence being presented in this Supplemental Brief on Appeal. Therefore, the rejection of claims 16-18 should be reversed for at least the reasons discussed above for claims 1-7, 12-15, 19, 21, 24-26, 31, 33 and 36 and further because the compositions of Zdrahala do not include a fibril component having a melting point as low as recited in these claims.

C. Claim 31

Claim 31 is directed to a medical balloon formed from a combination of a semi-compliant matrix material and a plurality of individual fibril cores distributed evenly about the circumference of the balloon. See application, page 6, line 29-page 7, line 22. The embodiment of claim 31 therefore requires both a particular type of matrix material and a non-random distribution of the fibril cores.

Claim 31 is seen to be patentable over the combination of Boretos and Zdrahala for the same reason that claim 1 is patentable, and also because Zdrahala does not teach or suggest the structured composition as recited.

Zdrahala, which is relied upon for the composition, does not show evenly spaced cores, nor does it teach or suggest the specific combination of such cores with a semi-compliant matrix material. The Zdrahala matrix materials cover a range of

compliance, including materials which can be characterized as semi-compliant,[2] but unlike the embodiment found in claim 31 of the present application, Zdrahala fails to teach or suggest employing a certain compliance material in combination with a plurality of individual fibril cores evenly distributed about the circumference of the balloon.

Thus, the combination of references does not suggest the specific combination of materials found in claim 31 of the present application for use in a polymer balloon. Therefore, even if the combination of Boretos and Zdrahala was a viable rejection of claim 1, the combination would not create a *prima facie* case of obviousness with respect to claim 31 and its dependents.

E. Claim 33

Claim 33 depends from claim 31 and is seen as being patentable for the same reasons already described for claim 31. Additionally, the recitation of the balloon longitudinal expansion rate of less than 5% is not taught or suggested in either reference.

In this particular, Appellants note that the longitudinal expansion property of a balloon is quite different than that of catheter tubing. Balloons have different wall thicknesses and undergo different processing than catheter tubing. Consequently, a skilled person does not know what longitudinal expansion would be obtained using a material for catheter tubing to form a balloon both because the balloon is further processed beyond what tubing is, and because the wall thickness of a balloon is thinner. Thus, the longitudinal expansion of a balloon would not be predictable from catheter

[2] See, for example, U.S. Patent Nos. 6,406,457; 6,171,278; 6,146,356; 5,951,941; 5,830,182; 5,556,383; 5,500,181; 5,447,497; 5,403,340; 5,348,538

tubing. Longitudinal expansion with respect to balloons is discussed in the Background at page 1 of the present specification.

Neither Boretos, which describes unreinforced catheter tubing and unreinforced balloons, nor Zdrahala, which is directed to catheter tubing, provide any direction as to a balloon having the expansion characteristics recited in this claim.

Thus, Appellants submit that the rejection of claim 33 should be reversed for the reasons given for claim 31 and also for the reason that a balloon having the longitudinal expansion property of this claim is not taught or suggested by the cited references.

III. *The Examiner erred in rejecting claims 20 and 22-23 under 35 U.S.C. §103(a) as being unpatentable over Boretos in view of Zdrahala evidenced by Polymers (A Property Database).*

A. Claims 20 and 22-23.

The Office Action asserts that Boretos fails to teach the fiber-reinforcement of the balloon for a medical device, Zdrahala teaches that the fiber component is in a polyamide matrix, and that Polymers teaches that nylon 12 has a melting point range of around 140 to about 265 °C.

Appellants disagree.

As discussed above, the combination of Boretos and Zdrahala fails to teach a balloon with reinforcing fibers. No assertion is made that Polymers teaches or suggests balloons with reinforcing fibers. Consequently, this rejection must be reversed for at least the reasons that the rejection based on the combination of Boretos and

Zdrahala must be reversed. The combination fails to teach a balloon as in claim 1 of the present invention.

IV. *The Examiner erred in rejecting claims 8-11 under 35 U.S.C. §103(a) as being unpatentable over Boretos in view of Zdrahala as applied to claims 1-7, 12-19, 21, 24-26, 31, 33 and 36 above, and further in view of Heino et al. (US 6,221,962).*

The Office Action asserts that Zdrahala teaches liquid crystal fiber-reinforcement of the catheter tubing, but fails to teach the compatibilizer. Heino et al. is directed to liquid crystal polymer blends wherein the liquid crystalline polymer forms fibers which orient in the flow direction of the thermoplastic matrix melt, improving the tensile strength and modulus of elasticity of the solidified matrix (col. 1, lines 20-40) and the compatibilizer for the blends can be a block copolymer (col. 3, lines 1-15). The Office Action asserts that since Heino et al. teach that the compatibilizer improves adhesion and dispersion of the liquid crystal polymer in the matrix, thus improving the impact strength of the composite (col. 1, lines 20-70), it would have been obvious to onen of ordinary skill in the art to have provided the compatibilizer as taught by Heino et al. in the liquid crystal polymer blend of Zdrahala for use in the invention of Boretos in order to obtain a balloon catheter with the desired impact strength as well as tensile strength and modulus of elasticity.

As discussed above, the combination of Boretos and Zdrahala fails to teach a balloon with reinforcing fibers. No assertion is made that Heino et al. teach or suggest balloons with reinforcing fibers. Again, this rejection must be reversed for at least the reasons that the rejection based on the combination of Boretos and Zdrahala

must be reversed. The combination fails to teach a balloon as in claim 1 of the present invention.

V. CONCLUSION

By the foregoing arguments it has been demonstrated that claims 1-7, 12-19, 21, 24-26, 31, 33 and 36 are not obvious over Boretos (US 4,254,774) in view of Zdrahala (US 5,156,785); and that claims 20 and 22-23 are not obvious over Boretos in view of Zdrahala and further in view of Polymers; and that claims 8-11 are not obvious over Boretos in view of Zdrahala as applied to claims 1-7, 12-19, 21, 24-26, 31, 33 and 36 above, and further in view of Heino et al. (US 6,221,962).

Respectfully submitted,

VIDAS, ARRETT & STEINKRAUS

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Appendix A

CLAIMS ON APPEAL

1. A dimensionally stable polymer balloon having a longitudinal axis and composed of a micro-composite material, the micro-composite material comprising a polymer matrix component and a polymer fibril component distributed in the polymer matrix component, the fibril component having micro-fibers oriented substantially parallel or diagonally to the longitudinal axis of the balloon.

2. The dimensionally stable polymer balloon of claim 1 mounted on a catheter.

3. The dimensionally stable polymer balloon of claim 1, wherein said micro-composite material comprises about 0.1 wt-% to about 20 wt-% of said fibril component.

4. The dimensionally stable polymer balloon of claim 1, wherein said micro-composite material comprises about 0.5 wt-% to about 8 wt-% of said fibril component.

5. The dimensionally stable polymer balloon of claim 1, wherein said micro-composite material comprises about 0.5 wt-% to about 15 wt-% of said fibril component.

6. The dimensionally stable balloon of claim 1, wherein said micro-composite material comprises about 50 wt-% to about 99.9 wt-% of said polymer matrix component.

7. The dimensionally stable balloon of claim 1, wherein said micro-composite material comprises about 85 wt-% to about 99.5 wt-% of said polymer matrix component.

8. The dimensionally stable balloon of claim 1, wherein the micro-composite material further comprises a compatibilizer component.

9. The dimensionally stable balloon of claim 8 wherein said compatibilizer is a block copolymer.

10. The dimensionally stable balloon of Claim 8 wherein said compatibilizer is selected from the group consisting of copolyester elastomers, ethylene unsaturated ester copolymers, copolymers of ethylene and a carboxylic acid or derivative thereof, polyolefins or ethylene-unsaturated ester copolymers grafted with functional monomers, copolymers of ethylene and a carboxylic acid or derivative thereof, terpolymers of ethylene, copolymers of unsaturated esters and carboxylic acids or derivatives thereof, maleic acid grafted styrene/ethylene-butadiene-styrene block copolymers, acrylic

elastomers, glycidyl(meth)acrylates, ionomeric copolymers, polyester-polyether block copolymers, and mixtures thereof.

11. The dimensionally stable polymer balloon of claim 1, wherein said compatibilizer is selected from the group consisting of ethylene-maleic anhydride copolymers, ethylene-methyl acrylate copolymers, ethylene-methyl acrylate-maleic anhydride terpolymers, ethylene- methyl acrylate-methacrylic acid terpolymers, alkyl(meth)acrylate-ethylene-glycidyl(meth)acrylate terpolymers, and mixtures thereof.

12. The dimensionally stable balloon of claim 1, wherein the fibril component is composed of rigid-rod thermoplastic material.

13. The dimensionally stable balloon of claim 1, wherein the fibril component is composed of semi-rigid-rod thermoplastic material.

14. The dimensionally stable balloon of claim 1, wherein the fibril component is composed of liquid crystal polymer material.

15. The dimensionally stable balloon of claim 1, wherein the fibril component has a melting point of about 275° C or less.

16. The dimensionally stable balloon of claim 1, wherein the fibril component has a melting point of about 250° C or less.

17. The dimensionally stable balloon of claim 1, wherein the fibril component has a melting point of about 150° to about 249° C.

18. The dimensionally stable balloon of claim 1, wherein the fibril component has a melting point of about 230° C or less.

19. The dimensionally stable balloon of claim 1, wherein the matrix component comprises a semi-compliant thermoplastic polymer.

20. The dimensionally stable balloon of claim 1, wherein the matrix component has a melting point of about 140° C to about 265° C.

21. The dimensionally stable polymer balloon of claim 1, wherein the matrix component comprises a polyamide-polyester block copolymer, a polyamide/polyether/polyester block copolymer, a polyester-polyether block copolymer, or a mixture thereof.

22. The dimensionally stable polymer balloon of claim 1, wherein the matrix component has a melting point of about 150° C to about 230° C.

23. The dimensionally stable polymer balloon of claim 1, wherein the matrix component has a melting point of about 220° or less.

24. The dimensionally stable balloon of claim 1, wherein the micro-fibers are oriented substantially parallel to the longitudinal axis of the balloon.

25. The dimensionally stable balloon of claim 1, wherein the micro-fibers are oriented diagonally to the longitudinal axis of the balloon.

26. The dimensionally stable balloon of claim 1, wherein the orientation of the micro-fibers relative to the longitudinal axis of the balloon changes through the balloon material in a direction transverse to said longitudinal axis.

31. (Amended) An inflatable medical balloon having a circumference and a longitudinal axis comprising:

a matrix material, said matrix material characterized as being semi-compliant; and having a plurality of individual fiber cores mixed therethrough, said cores being evenly distributed about the circumference of the balloon and being composed of one or more materials which are characterized as being stronger than the matrix material and having a bulk elongation less than the matrix material when the one or more materials are oriented in the direction of the longitudinal axis, and the matrix material and the core material operatively adhering to one another.

33. The medical balloon of claim 31, wherein the balloon longitudinally expands less than 5% beyond the pre-inflation state.

36. The medical balloon of claim 31, wherein the balloon has a multilayer structure.

Appendix B

1. Ticona Vectra A950
2. Solvay Advanced Polymers Xydar G-930 Liquid Crystal
3. Ticona Vectra C550 Liquid Crystal Polymer (LCP), 50% Mine
4. Ticona Vectra B230 Liquid Crystal Polymer (LCP), 30% Carbon
5. Ticona Vectra A700 Liquid Crystal Polymer (LCP), 30% Glass
6. Ticona Vectra A625 Liquid Crystal Polymer (LCP), 25% Grapl
7. Ticona Vectra A540 Liquid Crystal Polymer (LCP), 40% Mine
8. Ticona Vectra A530 Liquid Crystal Polymer (LCP), 30% Mine
9. Ticona Vectra A515 Liquid Crystal Polymer (LCP), 15% Mine
10. Ticona Vectra A440 Liquid Crystal Polymer (LCP), Glass/PT
11. Ticona Vectra A435 Liquid Crystal Polymer (LCP), Glass/PT
12. Ticona Vectra A430 Liquid Crystal Polymer (LCP), LCP/PTF
13. Ticona Vectra A422 Liquid Crystal Polymer (LCP), Glass/Grap
14. Ticona Vectra A420 Liquid Crystal Polymer (LCP), Glass/Mineral
15. Ticona Vectra A410 Liquid Crystal Polymer (LCP), 25% Glass/25%
16. Ticona Vectra A230 Liquid Crystal Polymer (LCP), 30% Carbon Fil
17. Ticona Vectra V140 Liquid Crystal Polymer (LCP), 40% Glass
18. Ticona Vectra L130 Liquid Crystal Polymer (LCP), 30% Glass
19. Ticona Vectra K140 Liquid Crystal Polymer (LCP), 40% Glass
20. Ticona Vectra K130 Liquid Crystal Polymer (LCP), 30% Glass
21. Ticona Vectra E130i Liquid Crystal Polymer (LCP), 30% Glass
22. Ticona Vectra C150 Liquid Crystal Polymer (LCP), 50% Glass

23. Ticona Vectra C130 Liquid Crystal Polymer (LCP), 30% Glass
24. Ticona Vectra C115 Liquid Crystal Polymer (LCP), 15% Glass
25. Ticona Vectra B130 Liquid Crystal Polymer (LCP), 30% Glass
26. Ticona Vectra A150 Liquid Crystal Polymer (LCP), 50% Glass
27. Ticona Vectra A130 Liquid Crystal Polymer (LCP), 30% Glass
28. Ticona Vectra A115 Liquid Crystal Polymer (LCP), 15% Glass
29. Ticona General Products List
30. US 5,834,560 – Baird et al
31. Vectran HS LCP Fiber
32. Vectran M LCP Fiber

Ticona Vectra® A950 Liquid Crystal Polymer (LCP)

Printer friendly version

Download to Excel (requires Excel and Windows)

Subcategory: Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Material Notes:
Description: Base resin having a melt point of 280°C. Suitable for extrusion into film, sheet, and fibers. Not recon

Data provided by Ticona.

No vendors are listed for this material. Please **click here** if you are a supplier and would like information on how t

Physical Properties	Metric	English
Density	1.4 g/cc	0.0506 lb/in³
Water Absorption	0.03 %	0.03 %
Linear Mold Shrinkage	0 cm/cm	0 in/in
Linear Mold Shrinkage, Transverse	0.007 cm/cm	0.007 in/in
Mechanical Properties		
Tensile Strength at Break	182 MPa	26400 psi
Elongation at Break	3.4 %	3.4 %
Tensile Modulus	10.6 GPa	1540 ksi
Flexural Modulus	9.1 GPa	1320 ksi
Flexural Strength	158 MPa	22900 psi
Izod Impact, Notched (ISO)	95 kJ/m²	45.2 ft-lb/in²
Izod Impact, Unnotched (ISO)	252 kJ/m²	120 ft-lb/in²
Charpy Impact, Unnotched	26.7 J/cm²	127 ft-lb/in²
Charpy Impact, Notched	9.5 J/cm²	45.2 ft-lb/in²
Tensile Creep Modulus, 1 hour	9000 MPa	1.31e+006 psi
Tensile Creep Modulus, 1000 hours	6600 MPa	957000 psi
Electrical Properti s		
Volume Resistivity	1e+015 ohm-cm	1e+015 ohm-cm

Surface Resistance	1e+014 ohm	1e+014 ohm
Dielectric Constant	3	3
Dielectric Constant	3.2	3.2
Dielectric Strength	47 kV/mm	1190 kV/in
Dissipation Factor	0.0159	0.0159
Dissipation Factor	0.02	0.02
Comparative Tracking Index	150 V	150 V

Thermal Properties

CTE, linear 20°C	4 µm/m-°C	2.22 µin/in-°F
CTE, linear 20°C Transverse to Flow	38 µm/m-°C	21.1 µin/in-°F
Melting Point	280 °C	536 °F
Deflection Temperature at 1.8 MPa (264 psi)	187 °C	369 °F
Deflection Temperature at 8.0 MPa	94 °C	201 °F
Vicat Softening Point	145 °C	293 °F
Flammability, UL94	V-0	V-0

Processing Properties

Rear Barrel Temperature	270 - 280 °C	518 - 536 °F
Middle Barrel Temperature	280 - 290 °C	536 - 554 °F
Front Barrel Temperature	285 - 295 °C	545 - 563 °F
Nozzle Temperature	290 - 300 °C	554 - 572 °F
Melt Temperature	285 - 295 °C	545 - 563 °F
Mold Temperature	80 - 120 °C	176 - 248 °F

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistai data for scientific or engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. W or one of its raw conversions in your calculations to minimize rounding error. We also ask that you refer to MatWeb's disclaimer and terms of use regai the property values for this datasheet as they were originally entered into MatWeb.

MatWeb.com, The Online Materials Database

Solvay Advanced Polymers Xydar® G-930 Liquid Crystal Polymer

Subcategory: Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Close Analogs: This product line was acquired by Solvay Advanced Polymers from BP Amoco in November 2001.

Key Words: LCP

Material Notes:

Data provided by the manufacturer, Amoco Corporation.

This injection-moldable LCP offers the highest heat deflection temperature of any engineering thermoplastics. Dimensionally stable, it has microwave transparency, excellent chemical resistance and is inherently UL94 V-0.

Physical Properties	Metric	English	Comments
Density	1.6 g/cc	0.0578 lb/in³	ASTM D792
Water Absorption	Max 0.1 %	Max 0.1 %	24 hours; ASTM D570
Mechanical Properties			
Tensile Strength, Yield	135 MPa	19600 psi	ASTM D638
Elongation at Break	1.6 %	1.6 %	ASTM D638
Tensile Modulus	18.6 GPa	2700 ksi	ASTM D638
Flexural Modulus	13.4 GPa	1940 ksi	ASTM D790
Flexural Yield Strength	172 MPa	24900 psi	ASTM D790
Izod Impact, Notched	1 J/cm	1.87 ft-lb/in	ASTM D256
Electrical Properties			
Dielectric Constant	4.2	4.2	at 1 kHz; ASTM D150
Dielectric Constant, Low Frequency	4.2	4.2	at 1 kHz; ASTM D150
Dissipation Factor	0.013	0.013	at 1 kHz; ASTM D150
Dissipation Factor, Low Frequency	0.013	0.013	at 1 kHz; ASTM D150
Thermal Properties			
CTE, linear 20°C	12 µm/m-°C	6.67 µin/in-°F	in flow direction. ASTM E381
CTE, linear 20°C Transverse to Flow	20 µm/m-°C	11.1 µin/in-°F	ASTM E381
Maximum Service Temperature, Air	220 °C	428 °F	UL Relative Thermal Index, Electrical, per UL 746B. Mechanical with impact 200°C (400°F); Mechanical without impact 220°C (430°F)

Deflection Temperature at 1.8 MPa (264 psi)	271 °C	520 °F	ASTM D648
UL RTI, Electrical	220 °C	428 °F	at 0.8 mm
UL RTI, Mechanical with Impact	200 °C	392 °F	at 0.8 mm
UL RTI, Mechanical without Impact	220 °C	428 °F	at 0.8 mm
Flammability, UL94	V-0	V-0	V-0 @ 0.8 mm
Flammability, UL94	V-0	V-0	V-0 @ 0.8 mm

MatWeb.com, The Online Materials Database

Ticona Vectra® C550 Liquid Crystal Polymer (LCP), 50% Mineral Filled

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

Physical Properties	**Metric**	**English**	**Comments**
Density	1.89 g/cc	0.0683 lb/in³	ISO 1183
Water Absorption	0.02 %	0.02 %	Immersion to equilibrium; ISO 62
Moisture Absorption at Equilibrium	0.02 %	0.02 %	ISO 62
Linear Mold Shrinkage	0.003 cm/cm	0.003 in/in	
Linear Mold Shrinkage, Transverse	0.004 cm/cm	0.004 in/in	
Mechanical Properties			
Tensile Strength, Ultimate	115 MPa	16700 psi	ISO 527
Elongation at Break	2.4 %	2.4 %	IEC 527
Tensile Modulus	19 GPa	2760 ksi	ISO 527
Flexural Modulus	17 GPa	2470 ksi	ISO 178
Flexural Yield Strength	170 MPa	24700 psi	ISO 178
Compressive Yield Strength	95 MPa	13800 psi	1% Deflection, ISO 604
Charpy Impact, Notched	0.4 J/cm²	1.9 ft-lb/in²	ISO 179
Tensile Impact Strength	50 kJ/m²	23.8 ft-lb/in²	Notched; ASTM D1822
Compressive Modulus	16.5 GPa	2390 ksi	ISO 604
Izod Impact, Notched (ISO)	5 kJ/m²	2.38 ft-lb/in²	ISO 180/1A
Electrical Properties			
Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm	IEC 93
Surface Resistance	1e+016 ohm	1e+016 ohm	IEC 93
Dielectric Constant	3.7	3.7	10 MHz
Dielectric Constant, Low Frequency	4	4	1 kHz; IEC 250
Dissipation Factor	0.007	0.007	10 MHz
Dissipation Factor, Low Frequency	0.02	0.02	1kHz; IEC 250
Arc Resistance	183 sec	183 sec	
Comparative Tracking Index	225 V	225 V	IEC 112

Thermal Properties

CTE, linear 20°C	1 µm/m-°C	0.556 µin/in-°F	Flow. -50 to 200°C (-58 to 390°F)
CTE, linear 20°C Transverse to Flow	60 µm/m-°C	33.3 µin/in-°F	-50 to 200°C (-58 to 390° F).
CTE, linear 100°C	1 µm/m-°C	0.556 µin/in-°F	Flow from -50 to 200°C (-58 to 390°F)
CTE, linear 100°C	60 µm/m-°C	33.3 µin/in-°F	Transverse from -50 to 200°C (-58 to 390°F)
Melting Point	325 °C	617 °F	ISO 3146
Maximum Service Temperature, Air	130 °C	266 °F	Generic Rating for Vectra LCP
Deflection Temperature at 1.8 MPa (264 psi)	225 °C	437 °F	ISO 75/A
UL RTI, Electrical	130 °C	266 °F	Generic Rating for Vectra LCP
UL RTI, Mechanical with Impact	130 °C	266 °F	Generic Rating for Vectra LCP

Ticona Vectra® B230 Liquid Crystal Polymer (LCP), 30% Carbon Fiber R

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like information this material.

Physical Properties	Metric	English
Density	1.5 g/cc	0.0542 lb/in³
Water Absorption	0.03 %	0.03 %
Moisture Absorption at Equilibrium	0.03 %	0.03 %
Linear Mold Shrinkage	0 cm/cm	0 in/in
Linear Mold Shrinkage, Transverse	0 cm/cm	0 in/in
Mechanical Properties		
Hardness, Rockwell M	99	99
Tensile Strength, Ultimate	190 MPa	27600 psi
Elongation at Break	0.7 %	0.7 %
Tensile Modulus	30 GPa	4350 ksi
Flexural Modulus	25.5 GPa	3700 ksi
Flexural Yield Strength	320 MPa	46400 psi
Compressive Yield Strength	204 MPa	29600 psi
Charpy Impact, Notched	0.9 J/cm²	4.28 ft-lb/in²
Tensile Impact Strength	40 kJ/m²	19 ft-lb/in²
Compressive Modulus	33 GPa	4790 ksi

Izod Impact, Notched (ISO)	9 kJ/m²	4.28 ft-lb/in²	

Electrical Properties

Electrical Resistivity	0.1 ohm-cm	0.1 ohm-cm	

Thermal Properties

CTE, linear 20°C	0 µm/m-°C	0 µin/in-°F	
CTE, linear 20°C Transverse to Flow	45 µm/m-°C	25 µin/in-°F	
CTE, linear 100°C	0 µm/m-°C	0 µin/in-°F	
CTE, linear 100°C	45 µm/m-°C	25 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	235 °C	455 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

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Ticona Vectra® A700 Liquid Crystal Polymer (LCP), 30% Glass Reinf

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	Metric	English
Density	1.63 g/cc	0.0589 lb/in³
Mechanical Properties		
Tensile Strength, Ultimate	140 MPa	20300 psi
Elongation at Break	1.5 %	1.5 %
Tensile Modulus	14 GPa	2030 ksi
Flexural Modulus	14.4 GPa	2090 ksi
Flexural Yield Strength	230 MPa	33400 psi
Compressive Yield Strength	100 MPa	14500 psi
Charpy Impact, Notched	1.5 J/cm²	7.14 ft-lb/in²
Compressive Modulus	14.5 GPa	2100 ksi
Izod Impact, Notched (ISO)	12 kJ/m²	5.71 ft-lb/in²
Electrical Properties		
Electrical Resistivity	10000 ohm-cm	10000 ohm-cm
Surface Resistance	1e+010 ohm	1e+010 ohm
Comparative Tracking Index	175 V	175 V

Thermal Properties

CTE, linear 20°C	9 µm/m-°C	5 µin/in-°F	
CTE, linear 20°C Transverse to Flow	60 µm/m-°C	33.3 µin/in-°F	
CTE, linear 100°C	60 µm/m-°C	33.3 µin/in-°F	Trans
CTE, linear 100°C	9 µm/m-°C	5 µin/in-°F	
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	225 °C	437 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

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Ticona Vectra® A625 Liquid Crystal Polymer (LCP), 25% Graphite F

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	**Metric**	**English**
Density	1.54 g/cc	0.0556 lb/in³
Water Absorption	0.03 %	0.03 %
Moisture Absorption at Equilibrium	0.03 %	0.03 %
Linear Mold Shrinkage	0.001 cm/cm	0.001 in/in
Linear Mold Shrinkage, Transverse	0.003 cm/cm	0.003 in/in

Mechanical Properties		
Hardness, Rockwell M	62	62
Tensile Strength, Ultimate	140 MPa	20300 psi
Elongation at Break	5.7 %	5.7 %
Tensile Modulus	10 GPa	1450 ksi
Flexural Modulus	10 GPa	1450 ksi
Flexural Yield Strength	140 MPa	20300 psi
Compressive Yield Strength	56 MPa	8120 psi
Charpy Impact, Notched	1.5 J/cm²	7.14 ft-lb/in²
Tensile Impact Strength	80 kJ/m²	38.1 ft-lb/in²
Compressive Modulus	9 GPa	1310 ksi

Coefficient of Friction	0.15	0.15	
Izod Impact, Notched (ISO)	22 kJ/m²	10.5 ft-lb/in²	

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm	
Surface Resistance	1e+015 ohm	1e+015 ohm	
Dielectric Constant	10	10	
Dielectric Constant, Low Frequency	25	25	
Dissipation Factor	0.14	0.14	
Dissipation Factor, Low Frequency	0.17	0.17	
Comparative Tracking Index	200 V	200 V	

Thermal Properties

CTE, linear 20°C	10 µm/m-°C	5.56 µin/in-°F	
CTE, linear 20°C Transverse to Flow	50 µm/m-°C	27.8 µin/in-°F	
CTE, linear 100°C	10 µm/m-°C	5.56 µin/in-°F	
CTE, linear 100°C	50 µm/m-°C	27.8 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	185 °C	365 °F	
Vicat Softening Point	227 °C	441 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

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Ticona Vectra® A540 Liquid Crystal Polymer (LCP), 40% Mineral Fi

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	**Metric**	**English**
Density	1.76 g/cc	0.0636 lb/in³
Water Absorption	0.02 %	0.02 %
Moisture Absorption at Equilibrium	0.02 %	0.02 %
Linear Mold Shrinkage	0.002 cm/cm	0.002 in/in
Linear Mold Shrinkage, Transverse	0.004 cm/cm	0.004 in/in
Mechanical Properties		
Hardness, Rockwell M	63	63
Tensile Strength, Ultimate	155 MPa	22500 psi
Elongation at Break	3.9 %	3.9 %
Tensile Modulus	19 GPa	2760 ksi
Flexural Modulus	16 GPa	2320 ksi
Flexural Yield Strength	195 MPa	28300 psi
Compressive Yield Strength	78 MPa	11300 psi
Charpy Impact, Notched	4 J/cm²	19 ft-lb/in²
Tensile Impact Strength	40 kJ/m²	19 ft-lb/in²
Compressive Modulus	12 GPa	1740 ksi

Coefficient of Friction	0.12	0.12
Izod Impact, Notched (ISO)	20 kJ/m²	9.52 ft-lb/in²

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm
Surface Resistance	1e+016 ohm	1e+016 ohm
Dielectric Constant	3.7	3.7
Dielectric Constant, Low Frequency	4.2	4.2
Dissipation Factor	0.008	0.008
Dissipation Factor, Low Frequency	0.02	0.02
Arc Resistance	180 sec	180 sec
Comparative Tracking Index	200 V	200 V

Thermal Properties

CTE, linear 20°C	0 µm/m-°C	0 µin/in-°F	
CTE, linear 20°C Transverse to Flow	50 µm/m-°C	27.8 µin/in-°F	
CTE, linear 100°C	0 µm/m-°C	0 µin/in-°F	
CTE, linear 100°C	50 µm/m-°C	27.8 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	200 °C	392 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

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Searches: Sequential | Material Type | Property | Composition | Trade Name | Manufacturer

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Ticona Vectra® A530 Liquid Crystal Polymer (LCP), 30% Mineral Fi

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	Metric	English
Density	1.65 g/cc	0.0596 lb/in³
Water Absorption	0.02 %	0.02 %
Moisture Absorption at Equilibrium	0.02 %	0.02 %
Linear Mold Shrinkage	0.002 cm/cm	0.002 in/in
Linear Mold Shrinkage, Transverse	0.004 cm/cm	0.004 in/in

Mechanical Properties		
Tensile Strength, Ultimate	175 MPa	25400 psi
Elongation at Break	5.5 %	5.5 %
Tensile Modulus	14 GPa	2030 ksi
Flexural Modulus	11 GPa	1600 ksi
Flexural Yield Strength	175 MPa	25400 psi
Compressive Yield Strength	60 MPa	8700 psi
Charpy Impact, Notched	0.4 J/cm²	1.9 ft-lb/in²
Compressive Modulus	10 GPa	1450 ksi
Izod Impact, Notched (ISO)	45 kJ/m²	21.4 ft-lb/in²

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm	
Surface Resistance	1e+017 ohm	1e+017 ohm	
Dielectric Constant	3.3	3.3	
Dielectric Constant, Low Frequency	3.7	3.7	
Dissipation Factor	0.008	0.008	
Dissipation Factor, Low Frequency	0.02	0.02	
Arc Resistance	180 sec	180 sec	
Comparative Tracking Index	200 V	200 V	

Thermal Properties

CTE, linear 20°C	12 µm/m-°C	6.67 µin/in-°F	
CTE, linear 20°C Transverse to Flow	69 µm/m-°C	38.3 µin/in-°F	
CTE, linear 100°C	12 µm/m-°C	6.67 µin/in-°F	
CTE, linear 100°C	69 µm/m-°C	38.3 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	185 °C	365 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

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Ticona Vectra® A515 Liquid Crystal Polymer (LCP), 15% Mineral Fi

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	Metric	English
Density	1.52 g/cc	0.0549 lb/in³
Water Absorption	0.02 %	0.02 %
Moisture Absorption at Equilibrium	0.02 %	0.02 %
Linear Mold Shrinkage	0.003 cm/cm	0.003 in/in
Linear Mold Shrinkage, Transverse	0.004 cm/cm	0.004 in/in

Mechanical Properties		
Hardness, Rockwell M	63	63
Tensile Strength, Ultimate	175 MPa	25400 psi
Elongation at Break	4.6 %	4.6 %
Tensile Modulus	14 GPa	2030 ksi
Flexural Modulus	11 GPa	1600 ksi
Flexural Yield Strength	170 MPa	24700 psi
Compressive Yield Strength	61 MPa	8850 psi
Charpy Impact, Notched	2.1 J/cm²	9.99 ft-lb/in²
Tensile Impact Strength	80 kJ/m²	38.1 ft-lb/in²
Compressive Modulus	10 GPa	1450 ksi

Coefficient of Friction	0.19	0.19	
Izod Impact, Notched (ISO)	60 kJ/m²	28.6 ft-lb/in²	

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm	
Surface Resistance	1e+017 ohm	1e+017 ohm	
Dielectric Constant	3.1	3.1	
Dielectric Constant, Low Frequency	3.6	3.6	
Dissipation Factor	0.009	0.009	
Dissipation Factor, Low Frequency	0.03	0.03	
Arc Resistance	145 sec	145 sec	
Comparative Tracking Index	175 V	175 V	

Thermal Properties

CTE, linear 20°C	-10 µm/m-°C	-5.56 µin/in-°F	
CTE, linear 20°C Transverse to Flow	64 µm/m-°C	35.6 µin/in-°F	
CTE, linear 100°C	-10 µm/m-°C	-5.56 µin/in-°F	
CTE, linear 100°C	64 µm/m-°C	35.6 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	185 °C	365 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistant format. User engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the origi calculations to minimize rounding error. We also ask that you refer to MatWeb's disclaimer and terms of use regarding this information. Click here to view all the pro originally entered into MatWeb.

Ticona Vectra® A440 Liquid Crystal Polymer (LCP), Glass/PTFE Fil

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatioı this material.

Physical Properties	**Metric**	**English**
Density	1.65 g/cc	0.0596 lb/in³
Mechanical Properties		
Tensile Strength, Ultimate	180 MPa	26100 psi
Elongation at Break	2.6 %	2.6 %
Tensile Modulus	16 GPa	2320 ksi
Flexural Modulus	15 GPa	2180 ksi
Flexural Yield Strength	245 MPa	35500 psi
Compressive Yield Strength	110 MPa	16000 psi
Charpy Impact, Notched	3.7 J/cm²	17.6 ft-lb/in²
Compressive Modulus	15 GPa	2180 ksi
Izod Impact, Notched (ISO)	22 kJ/m²	10.5 ft-lb/in²
Electrical Properties		
Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm
Surface Resistance	1e+016 ohm	1e+016 ohm
Dielectric Constant	3.4	3.4

Dielectric Constant, Low Frequency	3.7	3.7
Dissipation Factor	0.008	0.008
Dissipation Factor, Low Frequency	0.02	0.02
Arc Resistance	180 sec	180 sec
Comparative Tracking Index	175 V	175 V

Thermal Properties

Melting Point	280 °C	536 °F
Maximum Service Temperature, Air	130 °C	266 °F
Deflection Temperature at 1.8 MPa (264 psi)	230 °C	446 °F
UL RTI, Electrical	130 °C	266 °F
UL RTI, Mechanical with Impact	130 °C	266 °F
Flammability, UL94	V-0	V-0

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Searches: Sequential | Material Type | Property | Composition | Trade Name | Manufacturer

Ticona Vectra® A435 Liquid Crystal Polymer (LCP), Glass/PTFE Fil

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like information this material.

Physical Properties	Metric	English
Density	1.62 g/cc	0.0585 lb/in³
Mechanical Properties		
Tensile Strength, Ultimate	175 MPa	25400 psi
Elongation at Break	3.3 %	3.3 %
Tensile Modulus	12 GPa	1740 ksi
Flexural Modulus	10 GPa	1450 ksi
Flexural Yield Strength	210 MPa	30500 psi
Compressive Yield Strength	77 MPa	11200 psi
Charpy Impact, Notched	4 J/cm²	19 ft-lb/in²
Compressive Modulus	10.5 GPa	1520 ksi
Coefficient of Friction	0.11	0.11
Izod Impact, Notched (ISO)	30 kJ/m²	14.3 ft-lb/in²
Electrical Properties		
Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm
Surface Resistance	1e+016 ohm	1e+016 ohm

Dielectric Constant	2.8	2.8	
Dielectric Constant, Low Frequency	3.2	3.2	
Dissipation Factor	0.007	0.007	
Dissipation Factor, Low Frequency	0.02	0.02	
Comparative Tracking Index	175 V	175 V	

Thermal Properties

CTE, linear 20°C	0 µm/m-°C	0 µin/in-°F	
CTE, linear 20°C Transverse to Flow	85 µm/m-°C	47.2 µin/in-°F	
CTE, linear 100°C	0 µm/m-°C	0 µin/in-°F	
CTE, linear 100°C	85 µm/m-°C	47.2 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	230 °C	446 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistant format. User: engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the origi calculations to minimize rounding error. We also ask that you refer to MatWeb's disclaimer and terms of use regarding this information. Click here to view all the pro originally entered into MatWeb.

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Searches: Sequential | Material Type | Property | Composition | Trade Name | Manufacturer

Ticona Vectra® A430 Liquid Crystal Polymer (LCP), LCP/PTFE ble

Printer friendly version

Subcategory: Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatioı this material.

Physical Properties	**Metric**	**English**
Density	1.5 g/cc	0.0542 lb/in³
Mechanical Properties		
Tensile Strength, Ultimate	175 MPa	25400 psi
Elongation at Break	6.2 %	6.2 %
Tensile Modulus	10 GPa	1450 ksi
Flexural Modulus	8 GPa	1160 ksi
Flexural Yield Strength	130 MPa	18900 psi
Compressive Yield Strength	38 MPa	5510 psi
Charpy Impact, Notched	NB	NB
Compressive Modulus	6 GPa	870 ksi
Coefficient of Friction	0.18	0.18
Izod Impact, Notched (ISO)	55 kJ/m²	26.2 ft-lb/in²
Electrical Properties		
Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm
Surface Resistance	1e+015 ohm	1e+015 ohm

Dielectric Constant	2.9	2.9	
Dielectric Constant, Low Frequency	3.2	3.2	
Dissipation Factor	0.008	0.008	
Dissipation Factor, Low Frequency	0.02	0.02	
Arc Resistance	130 sec	130 sec	
Comparative Tracking Index	225 V	225 V	

Thermal Properties

CTE, linear 20°C	-10 µm/m-°C	-5.56 µin/in-°F	
CTE, linear 20°C Transverse to Flow	100 µm/m-°C	55.6 µin/in-°F	
CTE, linear 100°C	-10 µm/m-°C	-5.56 µin/in-°F	
CTE, linear 100°C	100 µm/m-°C	55.6 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	165 °C	329 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

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Ticona Vectra® A422 Liquid Crystal Polymer (LCP), Glass/Graphite F

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	Metric	English
Density	1.68 g/cc	0.0607 lb/in³
Water Absorption	0.02 %	0.02 %
Moisture Absorption at Equilibrium	0.02 %	0.02 %
Linear Mold Shrinkage	0.001 cm/cm	0.001 in/in
Linear Mold Shrinkage, Transverse	0.003 cm/cm	0.003 in/in

Mechanical Properties		
Tensile Strength, Ultimate	180 MPa	26100 psi
Elongation at Break	2.3 %	2.3 %
Tensile Modulus	20 GPa	2900 ksi
Flexural Modulus	16.5 GPa	2390 ksi
Flexural Yield Strength	250 MPa	36300 psi
Compressive Yield Strength	120 MPa	17400 psi
Charpy Impact, Notched	2.1 J/cm²	9.99 ft-lb/in²
Compressive Modulus	18.5 GPa	2680 ksi
Coefficient of Friction	0.18	0.18
Izod Impact, Notched (ISO)	22 kJ/m²	10.5 ft-lb/in²

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm
Surface Resistance	1e+015 ohm	1e+015 ohm
Dielectric Constant	6.2	6.2
Dielectric Constant, Low Frequency	7.4	7.4
Dissipation Factor	0.02	0.02
Dissipation Factor, Low Frequency	0.03	0.03
Arc Resistance	125 sec	125 sec
Comparative Tracking Index	225 V	225 V

Thermal Properties

CTE, linear 20°C	3 µm/m-°C	1.67 µin/in-°F	
CTE, linear 20°C Transverse to Flow	58 µm/m-°C	32.2 µin/in-°F	
CTE, linear 100°C	3 µm/m-°C	1.67 µin/in-°F	
CTE, linear 100°C	58 µm/m-°C	32.2 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	230 °C	446 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistant format. User: engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the origi calculations to minimize rounding error. We also ask that you refer to MatWeb's disclaimer and terms of use regarding this information. Click here to view all the pro originally entered into MatWeb.

Ticona Vectra® A420 Liquid Crystal Polymer (LCP), Glass/Mineral/Graph

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	Metric	English
Density	1.89 g/cc	0.0683 lb/in³
Water Absorption	0.02 %	0.02 %
Moisture Absorption at Equilibrium	0.02 %	0.02 %
Linear Mold Shrinkage	0.001 cm/cm	0.001 in/in
Linear Mold Shrinkage, Transverse	0.002 cm/cm	0.002 in/in

Mechanical Properties		
Hardness, Rockwell M	79	79
Tensile Strength, Ultimate	145 MPa	21000 psi
Elongation at Break	1.4 %	1.4 %
Tensile Modulus	22 GPa	3190 ksi
Flexural Modulus	20 GPa	2900 ksi
Flexural Yield Strength	200 MPa	29000 psi
Compressive Yield Strength	131 MPa	19000 psi
Charpy Impact, Notched	0.8 J/cm²	3.81 ft-lb/in²
Compressive Modulus	21.5 GPa	3120 ksi
Coefficient of Friction	0.17	0.17

Izod Impact, Notched (ISO)	6 kJ/m²	2.86 ft-lb/in²

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm
Surface Resistance	1e+016 ohm	1e+016 ohm
Dielectric Constant	5.9	5.9
Dielectric Constant, Low Frequency	6.7	6.7
Dissipation Factor	0.02	0.02
Dissipation Factor, Low Frequency	0.02	0.02
Arc Resistance	180 sec	180 sec
Comparative Tracking Index	250 V	250 V

Thermal Properties

CTE, linear 20°C	11 µm/m-°C	6.11 µin/in-°F	
CTE, linear 20°C Transverse to Flow	51 µm/m-°C	28.3 µin/in-°F	
CTE, linear 100°C	11 µm/m-°C	6.11 µin/in-°F	
CTE, linear 100°C	51 µm/m-°C	28.3 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	230 °C	446 °F	
Vicat Softening Point	238 °C	460 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

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Ticona Vectra® A410 Liquid Crystal Polymer (LCP), 25% Glass/25% Mine

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like information this material.

Physical Properties	Metric	English
Density	1.84 g/cc	0.0665 lb/in³
Water Absorption	0.04 %	0.04 %
Moisture Absorption at Equilibrium	0.04 %	0.04 %
Linear Mold Shrinkage	0.002 cm/cm	0.002 in/in
Linear Mold Shrinkage, Transverse	0.003 cm/cm	0.003 in/in

Mechanical Properties		
Hardness, Rockwell M	76	76
Tensile Strength, Ultimate	150 MPa	21800 psi
Elongation at Break	2 %	2 %
Tensile Modulus	20 GPa	2900 ksi
Flexural Modulus	18 GPa	2610 ksi
Flexural Yield Strength	220 MPa	31900 psi
Compressive Yield Strength	116 MPa	16800 psi
Charpy Impact, Notched	0.8 J/cm²	3.81 ft-lb/in²
Compressive Modulus	19 GPa	2760 ksi
Coefficient of Friction	0.21	0.21

Izod Impact, Notched (ISO)	12 kJ/m²	5.71 ft-lb/in²	

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm	
Surface Resistance	1e+016 ohm	1e+016 ohm	
Dielectric Constant	3.9	3.9	
Dielectric Constant, Low Frequency	4.4	4.4	
Dissipation Factor	0.007	0.007	
Dissipation Factor, Low Frequency	0.02	0.02	
Arc Resistance	180 sec	180 sec	
Comparative Tracking Index	175 V	175 V	

Thermal Properties

CTE, linear 20°C	5 µm/m-°C	2.78 µin/in-°F	
CTE, linear 20°C Transverse to Flow	66 µm/m-°C	36.7 µin/in-°F	
CTE, linear 100°C	5 µm/m-°C	2.78 µin/in-°F	
CTE, linear 100°C	66 µm/m-°C	36.7 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	235 °C	455 °F	
Vicat Softening Point	235 °C	455 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

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Ticona Vectra® A230 Liquid Crystal Polymer (LCP), 30% Carbon Fiber R

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like information this material.

Physical Properties	Metric	English
Density	1.49 g/cc	0.0538 lb/in³
Water Absorption	0.03 %	0.03 %
Moisture Absorption at Equilibrium	0.03 %	0.03 %
Linear Mold Shrinkage	0.001 cm/cm	0.001 in/in
Linear Mold Shrinkage, Transverse	0.002 cm/cm	0.002 in/in
Mechanical Properties		
Hardness, Rockwell M	83	83
Tensile Strength, Ultimate	125 MPa	18100 psi
Elongation at Break	0.8 %	0.8 %
Tensile Modulus	24.5 GPa	3550 ksi
Flexural Modulus	23 GPa	3340 ksi
Flexural Yield Strength	220 MPa	31900 psi
Compressive Yield Strength	136 MPa	19700 psi
Charpy Impact, Notched	1.5 J/cm²	7.14 ft-lb/in²
Tensile Impact Strength	60 kJ/m²	28.6 ft-lb/in²
Compressive Modulus	23.5 GPa	3410 ksi

Coefficient of Friction	0.12	0.12	
Izod Impact, Notched (ISO)	15 kJ/m²	7.14 ft-lb/in²	

Electrical Properties

Electrical Resistivity	0.1 ohm-cm	0.1 ohm-cm	

Thermal Properties

CTE, linear 20°C	-8 µm/m-°C	-4.44 µin/in-°F	
CTE, linear 20°C Transverse to Flow	58 µm/m-°C	32.2 µin/in-°F	
CTE, linear 100°C	-8 µm/m-°C	-4.44 µin/in-°F	
CTE, linear 100°C	58 µm/m-°C	32.2 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	225 °C	437 °F	
Vicat Softening Point	232 °C	450 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

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Ticona Vectra® V140 Liquid Crystal Polymer (LCP), 40% Glass Reinf

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	Metric	English
Density	1.67 g/cc	0.0603 lb/in³
Water Absorption	0.02 %	0.02 %
Moisture Absorption at Equilibrium	0.02 %	0.02 %
Linear Mold Shrinkage	0.002 cm/cm	0.002 in/in
Linear Mold Shrinkage, Transverse	0.004 cm/cm	0.004 in/in
Mechanical Properties		
Tensile Strength, Ultimate	130 MPa	18900 psi
Elongation at Break	1 %	1 %
Tensile Modulus	18 GPa	2610 ksi
Flexural Modulus	16 GPa	2320 ksi
Flexural Yield Strength	210 MPa	30500 psi
Compressive Yield Strength	134 MPa	19400 psi
Charpy Impact, Notched	1.1 J/cm²	5.24 ft-lb/in²
Compressive Modulus	16 GPa	2320 ksi
Izod Impact, Notched (ISO)	7 kJ/m²	3.33 ft-lb/in²

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm
Surface Resistance	1e+017 ohm	1e+017 ohm
Dielectric Constant	3.7	3.7
Dielectric Constant, Low Frequency	3.8	3.8
Dissipation Factor	0.002	0.002
Dissipation Factor, Low Frequency	0.007	0.007
Arc Resistance	165 sec	165 sec
Comparative Tracking Index	175 V	175 V

Thermal Properties

CTE, linear 20°C	10 µm/m-°C	5.56 µin/in-°F	
CTE, linear 20°C Transverse to Flow	67 µm/m-°C	37.2 µin/in-°F	
CTE, linear 100°C	10 µm/m-°C	5.56 µin/in-°F	
CTE, linear 100°C	67 µm/m-°C	37.2 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	270 °C	518 °F	
Deflection Temperature at 1.8 MPa (264 psi)	270 °C	518 °F	
Flammability, UL94	V-0	V-0	

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Ticona Vectra® L130 Liquid Crystal Polymer (LCP), 30% Glass Reinf

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	Metric	English
Density	1.61 g/cc	0.0582 lb/in³
Water Absorption	0.04 %	0.04 %
Moisture Absorption at Equilibrium	0.04 %	0.04 %
Linear Mold Shrinkage	0.001 cm/cm	0.001 in/in
Linear Mold Shrinkage, Transverse	0.002 cm/cm	0.002 in/in
Mechanical Properties		
Tensile Strength, Ultimate	155 MPa	22500 psi
Elongation at Break	1.6 %	1.6 %
Tensile Modulus	15 GPa	2180 ksi
Flexural Modulus	16 GPa	2320 ksi
Flexural Yield Strength	230 MPa	33400 psi
Compressive Yield Strength	100 MPa	14500 psi
Charpy Impact, Notched	4.3 J/cm²	20.5 ft-lb/in²
Compressive Modulus	14 GPa	2030 ksi
Izod Impact, Notched (ISO)	23 kJ/m²	10.9 ft-lb/in²

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm
Surface Resistance	1e+017 ohm	1e+017 ohm
Dielectric Constant	3.3	3.3
Dielectric Constant, Low Frequency	3.8	3.8
Dissipation Factor	0.02	0.02
Dissipation Factor, Low Frequency	0.02	0.02
Arc Resistance	130 sec	130 sec
Comparative Tracking Index	175 V	175 V

Thermal Properties

CTE, linear 20°C	5 µm/m-°C	2.78 µin/in-°F	
CTE, linear 20°C Transverse to Flow	65 µm/m-°C	36.1 µin/in-°F	
CTE, linear 100°C	5 µm/m-°C	2.78 µin/in-°F	
CTE, linear 100°C	65 µm/m-°C	36.1 µin/in-°F	Trans
Melting Point	302 °C	576 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	235 °C	455 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	
Oxygen Index	45 %	45 %	

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistant format. User engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the origi calculations to minimize rounding error. We also ask that you refer to MatWeb's disclaimer and terms of use regarding this information. Click here to view all the pro originally entered into MatWeb.

Ticona Vectra® K140 Liquid Crystal Polymer (LCP), 40% Glass Reinf

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	Metric	English
Density	1.71 g/cc	0.0618 lb/in³
Water Absorption	0.04 %	0.04 %
Moisture Absorption at Equilibrium	0.04 %	0.04 %
Linear Mold Shrinkage	0.001 cm/cm	0.001 in/in
Linear Mold Shrinkage, Transverse	0.002 cm/cm	0.002 in/in

Mechanical Properties	Metric	English
Tensile Strength, Ultimate	160 MPa	23200 psi
Elongation at Break	1.2 %	1.2 %
Tensile Modulus	20 GPa	2900 ksi
Flexural Modulus	18 GPa	2610 ksi
Flexural Yield Strength	245 MPa	35500 psi
Compressive Yield Strength	127 MPa	18400 psi
Charpy Impact, Notched	1.4 J/cm²	6.66 ft-lb/in²
Compressive Modulus	18 GPa	2610 ksi
Izod Impact, Notched (ISO)	14 kJ/m²	6.66 ft-lb/in²

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm
Surface Resistance	1e+017 ohm	1e+017 ohm
Dielectric Constant	3.6	3.6
Dielectric Constant, Low Frequency	4.1	4.1
Dissipation Factor	0.01	0.01
Dissipation Factor, Low Frequency	0.02	0.02
Arc Resistance	140 sec	140 sec
Comparative Tracking Index	175 V	175 V

Thermal Properties

CTE, linear 20°C	3 µm/m-°C	1.67 µin/in-°F	
CTE, linear 20°C Transverse to Flow	79 µm/m-°C	43.9 µin/in-°F	
CTE, linear 100°C	3 µm/m-°C	1.67 µin/in-°F	
CTE, linear 100°C	79 µm/m-°C	43.9 µin/in-°F	Trans
Melting Point	320 °C	608 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	217 °C	423 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistant format. User engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the origi calculations to minimize rounding error. We also ask that you refer to MatWeb's disclaimer and terms of use regarding this information. Click here to view all the pro originally entered into MatWeb.

Ticona Vectra® K130 Liquid Crystal Polymer (LCP), 30% Glass Reinf

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like information this material.

Physical Properties	**Metric**	**English**
Density	1.61 g/cc	0.0582 lb/in³
Water Absorption	0.04 %	0.04 %
Moisture Absorption at Equilibrium	0.04 %	0.04 %
Linear Mold Shrinkage	0.001 cm/cm	0.001 in/in
Linear Mold Shrinkage, Transverse	0.002 cm/cm	0.002 in/in
Mechanical Properties		
Tensile Strength, Ultimate	165 MPa	23900 psi
Elongation at Break	1.3 %	1.3 %
Tensile Modulus	18 GPa	2610 ksi
Flexural Modulus	16 GPa	2320 ksi
Flexural Yield Strength	245 MPa	35500 psi
Compressive Yield Strength	111 MPa	16100 psi
Charpy Impact, Notched	1.8 J/cm²	8.57 ft-lb/in²
Compressive Modulus	15 GPa	2180 ksi
Izod Impact, Notched (ISO)	16 kJ/m²	7.61 ft-lb/in²

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm	
Surface Resistance	1e+017 ohm	1e+017 ohm	
Dielectric Constant	3.4	3.4	
Dielectric Constant, Low Frequency	3.9	3.9	
Dissipation Factor	0.01	0.01	
Dissipation Factor, Low Frequency	0.02	0.02	
Arc Resistance	130 sec	130 sec	
Comparative Tracking Index	175 V	175 V	

Thermal Properties

CTE, linear 20°C	0 µm/m-°C	0 µin/in-°F	
CTE, linear 20°C Transverse to Flow	44 µm/m-°C	24.4 µin/in-°F	
CTE, linear 100°C	0 µm/m-°C	0 µin/in-°F	
CTE, linear 100°C	44 µm/m-°C	24.4 µin/in-°F	Trans
Melting Point	320 °C	608 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	215 °C	419 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	
Oxygen Index	44 %	44 %	

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistant format. User: engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the origi calculations to minimize rounding error. We also ask that you refer to MatWeb's disclaimer and terms of use regarding this information. Click here to view all the pro originally entered into MatWeb.

Ticona Vectra® E130i Liquid Crystal Polymer (LCP), 30% Glass Reinf

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	**Metric**	**English**
Density	1.61 g/cc	0.0582 lb/in³
Water Absorption	0.04 %	0.04 %
Moisture Absorption at Equilibrium	0.04 %	0.04 %
Linear Mold Shrinkage	0.001 cm/cm	0.001 in/in
Linear Mold Shrinkage, Transverse	0.002 cm/cm	0.002 in/in

Mechanical Properties		
Tensile Strength, Ultimate	160 MPa	23200 psi
Elongation at Break	1.6 %	1.6 %
Tensile Modulus	17 GPa	2470 ksi
Flexural Modulus	16 GPa	2320 ksi
Flexural Yield Strength	230 MPa	33400 psi
Compressive Yield Strength	93 MPa	13500 psi
Charpy Impact, Notched	1.8 J/cm²	8.57 ft-lb/in²
Compressive Modulus	14 GPa	2030 ksi
Izod Impact, Notched (ISO)	26 kJ/m²	12.4 ft-lb/in²

Electrical Properties

Electrical Resistivity		
Surface Resistance	1e+012 ohm-cm	1e+012 ohm-cm
Dielectric Constant	1e+017 ohm	1e+017 ohm
Dielectric Constant, Low Frequency	3.2	3.2
Dissipation Factor	3.5	3.5
Dissipation Factor, Low Frequency	0.02	0.02
Arc Resistance	0.03	0.03
Comparative Tracking Index	140 sec	140 sec
	200 V	200 V

Thermal Properties

CTE, linear 20°C			
CTE, linear 20°C Transverse to Flow	1 µm/m-°C	0.556 µin/in-°F	
CTE, linear 100°C	73 µm/m-°C	40.6 µin/in-°F	
CTE, linear 100°C	1 µm/m-°C	0.556 µin/in-°F	
Melting Point	73 µm/m-°C	40.6 µin/in-°F	Trans
Maximum Service Temperature, Air	335 °C	635 °F	
Deflection Temperature at 1.8 MPa (264 psi)	130 °C	266 °F	
UL RTI, Electrical	280 °C	536 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	130 °C	266 °F	
Oxygen Index	V-0	V-0	
	44 %	44 %	

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Ticona Vectra® C150 Liquid Crystal Polymer (LCP), 50% Glass Reinf

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplasti

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	Metric	English
Density	1.81 g/cc	0.0654 lb/in³
Water Absorption	0.01 %	0.01 %
Moisture Absorption at Equilibrium	0.01 %	0.01 %
Linear Mold Shrinkage	0.002 cm/cm	0.002 in/in
Linear Mold Shrinkage, Transverse	0.002 cm/cm	0.002 in/in
Mechanical Properties		
Tensile Strength, Ultimate	125 MPa	18100 psi
Elongation at Break	1 %	1 %
Tensile Modulus	24.5 GPa	3550 ksi
Flexural Modulus	20 GPa	2900 ksi
Flexural Yield Strength	205 MPa	29700 psi
Compressive Yield Strength	152 MPa	22000 psi
Charpy Impact, Notched	1.2 J/cm²	5.71 ft-lb/in²
Compressive Modulus	20.5 GPa	2970 ksi
Izod Impact, Notched (ISO)	10 kJ/m²	4.76 ft-lb/in²

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm	
Surface Resistance	1e+017 ohm	1e+017 ohm	
Dielectric Constant	4	4	
Dielectric Constant, Low Frequency	4.5	4.5	
Dissipation Factor	0.009	0.009	
Dissipation Factor, Low Frequency	0.02	0.02	
Arc Resistance	182 sec	182 sec	
Comparative Tracking Index	250 V	250 V	

Thermal Properties

CTE, linear 20°C	2 µm/m-°C	1.11 µin/in-°F	
CTE, linear 20°C Transverse to Flow	64 µm/m-°C	35.6 µin/in-°F	
CTE, linear 100°C	2 µm/m-°C	1.11 µin/in-°F	
CTE, linear 100°C	64 µm/m-°C	35.6 µin/in-°F	Trans
Melting Point	325 °C	617 °F	
Maximum Service Temperature, Air	220 °C	428 °F	220/2(
Deflection Temperature at 1.8 MPa (264 psi)	255 °C	491 °F	
UL RTI, Electrical	220 °C	428 °F	
UL RTI, Mechanical with Impact	200 °C	392 °F	
Flammability, UL94	V-0	V-0	

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Ticona Vectra® C130 Liquid Crystal Polymer (LCP), 30% Glass Reinf

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio
this material.

Physical Properties	**Metric**	**English**
Density	1.62 g/cc	0.0585 lb/in³
Water Absorption	0.02 %	0.02 %
Moisture Absorption at Equilibrium	0.02 %	0.02 %
Linear Mold Shrinkage	0.001 cm/cm	0.001 in/in
Linear Mold Shrinkage, Transverse	0.002 cm/cm	0.002 in/in

Mechanical Properties		
Tensile Strength, Ultimate	160 MPa	23200 psi
Elongation at Break	1.9 %	1.9 %
Tensile Modulus	15 GPa	2180 ksi
Flexural Modulus	14 GPa	2030 ksi
Flexural Yield Strength	245 MPa	35500 psi
Compressive Yield Strength	139 MPa	20200 psi
Charpy Impact, Notched	1.6 J/cm²	7.61 ft-lb/in²
Tensile Impact Strength	70 kJ/m²	33.3 ft-lb/in²
Compressive Modulus	22 GPa	3190 ksi
Izod Impact, Notched (ISO)	20 kJ/m²	9.52 ft-lb/in²

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm	
Surface Resistance	1e+016 ohm	1e+016 ohm	
Dielectric Constant	3.4	3.4	
Dielectric Constant, Low Frequency	3.8	3.8	
Dissipation Factor	0.009	0.009	
Dissipation Factor, Low Frequency	0.02	0.02	
Arc Resistance	182 sec	182 sec	
Comparative Tracking Index	200 V	200 V	

Thermal Properties

CTE, linear 20°C	3 µm/m-°C	1.67 µin/in-°F	
CTE, linear 20°C Transverse to Flow	58 µm/m-°C	32.2 µin/in-°F	
CTE, linear 100°C	3 µm/m-°C	1.67 µin/in-°F	
CTE, linear 100°C	58 µm/m-°C	32.2 µin/in-°F	Trans
Melting Point	325 °C	617 °F	
Maximum Service Temperature, Air	240 °C	464 °F	240/220°C (460/43
Deflection Temperature at 0.46 MPa (66 psi)	284 °C	543 °F	
Deflection Temperature at 1.8 MPa (264 psi)	255 °C	491 °F	
Vicat Softening Point	252 °C	486 °F	
UL RTI, Electrical	240 °C	464 °F	
UL RTI, Mechanical with Impact	220 °C	428 °F	
Flammability, UL94	V-0	V-0	
Oxygen Index	44 %	44 %	

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Ticona Vectra® C115 Liquid Crystal Polymer (LCP), 15% Glass Reinf

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like information this material.

Physical Properties	**Metric**	**English**
Density	1.5 g/cc	0.0542 lb/in³
Water Absorption	0.02 %	0.02 %
Moisture Absorption at Equilibrium	0.02 %	0.02 %
Linear Mold Shrinkage	0 cm/cm	0 in/in
Linear Mold Shrinkage, Transverse	0.002 cm/cm	0.002 in/in

Mechanical Properties		
Tensile Strength, Ultimate	160 MPa	23200 psi
Elongation at Break	2.5 %	2.5 %
Tensile Modulus	14 GPa	2030 ksi
Flexural Modulus	12 GPa	1740 ksi
Flexural Yield Strength	200 MPa	29000 psi
Compressive Yield Strength	82 MPa	11900 psi
Charpy Impact, Notched	3 J/cm²	14.3 ft-lb/in²
Compressive Modulus	11 GPa	1600 ksi
Izod Impact, Notched (ISO)	30 kJ/m²	14.3 ft-lb/in²

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm	
Surface Resistance	1e+017 ohm	1e+017 ohm	
Dielectric Constant	3.1	3.1	
Dielectric Constant, Low Frequency	3.4	3.4	
Dissipation Factor	0.01	0.01	
Dissipation Factor, Low Frequency	0.03	0.03	
Arc Resistance	135 sec	135 sec	
Comparative Tracking Index	150 V	150 V	

Thermal Properties

CTE, linear 20°C	-3 µm/m-°C	-1.67 µin/in-°F	
CTE, linear 20°C Transverse to Flow	66 µm/m-°C	36.7 µin/in-°F	
CTE, linear 100°C	-3 µm/m-°C	-1.67 µin/in-°F	
CTE, linear 100°C	66 µm/m-°C	36.7 µin/in-°F	Trans
Melting Point	325 °C	617 °F	
Maximum Service Temperature, Air	240 °C	464 °F	240/200°C (460/40
Deflection Temperature at 1.8 MPa (264 psi)	245 °C	473 °F	
UL RTI, Electrical	240 °C	464 °F	
UL RTI, Mechanical with Impact	220 °C	428 °F	
Flammability, UL94	V-0	V-0	

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Ticona Vectra® B130 Liquid Crystal Polymer (LCP), 30% Glass Reinf

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	Metric	English
Density	1.6 g/cc	0.0578 lb/in³
Water Absorption	0.02 %	0.02 %
Moisture Absorption at Equilibrium	0.02 %	0.02 %
Linear Mold Shrinkage	0 cm/cm	0 in/in
Linear Mold Shrinkage, Transverse	0.001 cm/cm	0.001 in/in

Mechanical Properties		
Tensile Strength, Ultimate	190 MPa	27600 psi
Elongation at Break	1 %	1 %
Tensile Modulus	20 GPa	2900 ksi
Flexural Modulus	17 GPa	2470 ksi
Flexural Yield Strength	300 MPa	43500 psi
Compressive Yield Strength	150 MPa	21800 psi
Charpy Impact, Notched	1.3 J/cm²	6.19 ft-lb/in²
Tensile Impact Strength	50 kJ/m²	23.8 ft-lb/in²
Compressive Modulus	21.5 GPa	3120 ksi
Izod Impact, Notched (ISO)	12 kJ/m²	5.71 ft-lb/in²

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm
Surface Resistance	1e+017 ohm	1e+017 ohm
Dielectric Constant	3.5	3.5
Dielectric Constant, Low Frequency	3.7	3.7
Dissipation Factor	0.006	0.006
Dissipation Factor, Low Frequency	0.01	0.01
Arc Resistance	124 sec	124 sec
Comparative Tracking Index	175 V	175 V

Thermal Properties

CTE, linear 20°C	1 µm/m-°C	0.556 µin/in-°F	
CTE, linear 20°C Transverse to Flow	53 µm/m-°C	29.4 µin/in-°F	
CTE, linear 100°C	1 µm/m-°C	0.556 µin/in-°F	
CTE, linear 100°C	53 µm/m-°C	29.4 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	130 °C	266 °F	
Deflection Temperature at 1.8 MPa (264 psi)	235 °C	455 °F	
Vicat Softening Point	243 °C	469 °F	
UL RTI, Electrical	130 °C	266 °F	
UL RTI, Mechanical with Impact	130 °C	266 °F	
Flammability, UL94	V-0	V-0	
Oxygen Index	51 %	51 %	

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Searches: Sequential | Material Type | Property | Composition | Trade Name | Manufacturer

Ticona Vectra® A150 Liquid Crystal Polymer (LCP), 50% Glass Reinf

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like information this material.

Physical Properties	Metric	English
Density	1.79 g/cc	0.0647 lb/in³
Water Absorption	0.01 %	0.01 %
Moisture Absorption at Equilibrium	0.01 %	0.01 %
Linear Mold Shrinkage	0.002 cm/cm	0.002 in/in
Linear Mold Shrinkage, Transverse	0.002 cm/cm	0.002 in/in

Mechanical Properties		
Hardness, Rockwell M	93	93
Tensile Strength, Ultimate	160 MPa	23200 psi
Elongation at Break	1.3 %	1.3 %
Tensile Modulus	24.5 GPa	3550 ksi
Flexural Modulus	21 GPa	3050 ksi
Flexural Yield Strength	250 MPa	36300 psi
Compressive Yield Strength	140 MPa	20300 psi
Charpy Impact, Notched	1.2 J/cm²	5.71 ft-lb/in²
Tensile Impact Strength	50 kJ/m²	23.8 ft-lb/in²
Compressive Modulus	21 GPa	3050 ksi

Coefficient of Friction	0.19	0.19	
Izod Impact, Notched (ISO)	12 kJ/m²	5.71 ft-lb/in²	

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm	
Surface Resistance	1e+016 ohm	1e+016 ohm	
Dielectric Constant	4	4	
Dielectric Constant, Low Frequency	4.5	4.5	
Dissipation Factor	0.008	0.008	
Dissipation Factor, Low Frequency	0.02	0.02	
Arc Resistance	180 sec	180 sec	
Comparative Tracking Index	175 V	175 V	

Thermal Properties

CTE, linear 20°C	3 µm/m-°C	1.67 µin/in-°F	
CTE, linear 20°C Transverse to Flow	64 µm/m-°C	35.6 µin/in-°F	
CTE, linear 100°C	3 µm/m-°C	1.67 µin/in-°F	
CTE, linear 100°C	64 µm/m-°C	35.6 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	220 °C	428 °F	220/2:
Deflection Temperature at 0.46 MPa (66 psi)	252 °C	486 °F	
Deflection Temperature at 1.8 MPa (264 psi)	240 °C	464 °F	
Vicat Softening Point	235 °C	455 °F	
UL RTI, Electrical	220 °C	428 °F	
UL RTI, Mechanical with Impact	220 °C	428 °F	
Flammability, UL94	V-0	V-0	

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Ticona Vectra® A130 Liquid Crystal Polymer (LCP), 30% Glass Reinf

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like information this material.

Physical Properties	Metric	English
Density	1.62 g/cc	0.0585 lb/in³
Water Absorption	0.02 %	0.02 %
Moisture Absorption at Equilibrium	0.02 %	0.02 %
Linear Mold Shrinkage	0.001 cm/cm	0.001 in/in
Linear Mold Shrinkage, Transverse	0.002 cm/cm	0.002 in/in
Mechanical Properties		
Hardness, Rockwell M	87	87
Tensile Strength, Ultimate	190 MPa	27600 psi
Elongation at Break	2.3 %	2.3 %
Tensile Modulus	16 GPa	2320 ksi
Flexural Modulus	15 GPa	2180 ksi
Flexural Yield Strength	280 MPa	40600 psi
Compressive Yield Strength	100 MPa	14500 psi
Charpy Impact, Notched	4 J/cm²	19 ft-lb/in²
Tensile Impact Strength	80 kJ/m²	38.1 ft-lb/in²
Compressive Modulus	14.5 GPa	2100 ksi

Coefficient of Friction	0.14	0.14	
Izod Impact, Notched (ISO)	26 kJ/m²	12.4 ft-lb/in²	

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm	
Surface Resistance	1e+017 ohm	1e+017 ohm	
Dielectric Constant	3.2	3.2	
Dielectric Constant, Low Frequency	3.7	3.7	
Dissipation Factor	0.008	0.008	
Dissipation Factor, Low Frequency	0.02	0.02	
Arc Resistance	140 sec	140 sec	
Comparative Tracking Index	175 V	175 V	

Thermal Properties

CTE, linear 20°C	0 µm/m-°C	0 µin/in-°F	
CTE, linear 20°C Transverse to Flow	79 µm/m-°C	43.9 µin/in-°F	
CTE, linear 100°C	0 µm/m-°C	0 µin/in-°F	
CTE, linear 100°C	79 µm/m-°C	43.9 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	240 °C	464 °F	240/220°C (460/43
Deflection Temperature at 0.46 MPa (66 psi)	252 °C	486 °F	
Deflection Temperature at 1.8 MPa (264 psi)	235 °C	455 °F	
Vicat Softening Point	232 °C	450 °F	
UL RTI, Electrical	240 °C	464 °F	
UL RTI, Mechanical with Impact	220 °C	428 °F	
Flammability, UL94	V-0	V-0	
Oxygen Index	43 %	43 %	

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Ticona Vectra® A115 Liquid Crystal Polymer (LCP), 15% Glass Reinf

Printer friendly version

Subcategory: Filled/Reinforced Thermoplastic; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Key Words: Hoechst Celanese Corporation

Material Notes:
Data provided by M. A. Hanna.

No vendors are listed for this material. Please **click here** if you are a supplier and would like information this material.

Physical Properties	Metric	English
Density	1.5 g/cc	0.0542 lb/in³
Water Absorption	0.02 %	0.02 %
Moisture Absorption at Equilibrium	0.02 %	0.02 %
Linear Mold Shrinkage	0 cm/cm	0 in/in
Linear Mold Shrinkage, Transverse	0.002 cm/cm	0.002 in/in

Mechanical Properties		
Tensile Strength, Ultimate	200 MPa	29000 psi
Elongation at Break	3.3 %	3.3 %
Tensile Modulus	14 GPa	2030 ksi
Flexural Modulus	12 GPa	1740 ksi
Flexural Yield Strength	240 MPa	34800 psi
Compressive Yield Strength	85 MPa	12300 psi
Charpy Impact, Notched	5.5 J/cm²	26.2 ft-lb/in²
Tensile Impact Strength	80 kJ/m²	38.1 ft-lb/in²
Compressive Modulus	10 GPa	1450 ksi
Coefficient of Friction	0.11	0.11

Izod Impact, Notched (ISO)	55 kJ/m²	26.2 ft-lb/in²	

Electrical Properties

Electrical Resistivity	1e+012 ohm-cm	1e+012 ohm-cm	
Surface Resistance	1e+017 ohm	1e+017 ohm	
Dielectric Constant	2.9	2.9	
Dielectric Constant, Low Frequency	3.3	3.3	
Dissipation Factor	0.008	0.008	
Dissipation Factor, Low Frequency	0.02	0.02	
Arc Resistance	135 sec	135 sec	
Comparative Tracking Index	200 V	200 V	

Thermal Properties

CTE, linear 20°C	-5 µm/m-°C	-2.78 µin/in-°F	
CTE, linear 20°C Transverse to Flow	89 µm/m-°C	49.4 µin/in-°F	
CTE, linear 100°C	-5 µm/m-°C	-2.78 µin/in-°F	
CTE, linear 100°C	89 µm/m-°C	49.4 µin/in-°F	Trans
Melting Point	280 °C	536 °F	
Maximum Service Temperature, Air	240 °C	464 °F	240/220°C (460/43
Deflection Temperature at 1.8 MPa (264 psi)	230 °C	446 °F	
UL RTI, Electrical	240 °C	464 °F	
UL RTI, Mechanical with Impact	220 °C	428 °F	
Flammability, UL94	V-0	V-0	

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	Material Name
1	Ticona Celanex® 1300A Polyester (PBT)
2	Ticona Celanex® 1400A Polyester (PBT)
3	Ticona Celanex® 1600A Polyester (PBT)
4	Ticona Celanex® 1700A Polyester (PBT)
5	Ticona Celanex® 2000 Polyester (PBT)
6	Ticona Celanex® 2000K Polyester (PBT)
7	Ticona Celanex® 2001 Polyester (PBT)
8	Ticona Celanex® 2002 Polyester (PBT)
9	Ticona Celanex® 2003 Polyester (PBT)
10	Ticona Celanex® 2004 Polyester (PBT)
11	Ticona Celanex® 2008 Polyester (PBT)
12	Ticona Celanex® 2012 Polyester (PBT)
13	Ticona Celanex® 2016 Polyester (PBT)
14	Ticona Celanex® 4016 Polyester (PBT)
15	Ticona Celanex® 1462Z Polyester (PBT), 30% Glass-Fiber
16	Ticona Celanex® 1632Z Polyester (PBT), 15% Glass-Fiber
17	Ticona Celanex® 3200 Polyester (PBT), 15% Glass-Fiber
18	Ticona Celanex® 3300 Polyester (PBT), 30% Glass-Fiber
19	Ticona Celanex® 3300LM Polyester (PBT), 30% Glass Reinforced
20	Ticona Celanex® 3300HR Polyester (PBT), 30% Glass Reinforced
21	Ticona Celanex® 3400 Polyester (PBT), 40% Glass-Fiber
22	Ticona Celanex® 3116 Polyester (PBT), 7.5% Glass-Fiber
23	Ticona Celanex® 3210 Polyester (PBT), 20% Glass-Fiber
24	Ticona Celanex® 3216 Polyester (PBT), 15% Glass-Fiber
25	Ticona Celanex® 3310 Polyester (PBT), 30% Glass-Fiber

26 Ticona Celanex® 3316 Polyester (PBT), 30% Glass-Fiber
27 Ticona Celanex® 4300 Polyester (PBT), 30% Glass-Fiber
28 Ticona Celanex® 4305 Polyester (PBT), 33% Glass-Fiber
29 Ticona Celanex® 4306 Polyester (PBT), 30% Glass-Fiber
30 Ticona Celanex® 5200 Polyester (PBT), 15% Glass-Fiber
31 Ticona Celanex® 5300 Polyester (PBT), 30% Glass-Fiber
32 Ticona Celanex® J600 Polyester (PBT), 40% Glass/Mineral
33 Ticona Celanex® 6400 Polyester (PBT), 40% Glass/Mineral
34 Ticona Celanex® 6406 Polyester (PBT), 40% Glass/Mineral
35 Ticona Celanex® 6500 Polyester (PBT), 30% Glass/Mineral
36 Ticona Celanex® 7700 Polyester (PBT), 35% Glass/Mineral
37 Ticona Celanex® 7305 Polyester (PBT), 35% Glass/Mineral
38 Ticona Celanex® 7316 Polyester (PBT), 35% Glass/Mineral
39 Ticona Celanex® 7716 Polyester (PBT), 35% Glass/Mineral
40 Ticona Celanese® Nylon 1000 Nylon 6/6, Dry As Molded
41 Ticona Celanese® Nylon 1000 Nylon 6/6, at 50% RH
42 Ticona Celanese® Nylon 1003 Nylon 6/6, Dry As Molded
43 Ticona Celanese® Nylon 1003 Nylon 6/6, at 50% RH
44 Ticona Celanese® Nylon 1100 Nylon 6/6, Dry As Molded
45 Ticona Celanese® Nylon 1100 Nylon 6/6, at 50% RH
46 Ticona Celanese® Nylon 1200 Nylon 6/6, Dry As Molded
47 Ticona Celanese® Nylon 1200 Nylon 6/6, at 50% RH
48 Ticona Celanese® N-186 Nylon 6/6, Dry As Molded
49 Ticona Celanese® N-186 Nylon 6/6, at 50% RH
50 Ticona Celanese® Nylon 1310 Nylon 6/6, Dry As Molded
51 Ticona Celanese® Nylon 1310 Nylon 6/6, at 50% RH
52 Ticona Celanese® Nylon 1400 Nylon 6/6, 13% Glass-Fiber Reinforced, Dry As Molded
53 Ticona Celanese® Nylon 1400 Nylon 6/6, 13% Glass-Fiber Reinforced, at 50% RH
54 Ticona Celanese® Nylon 1403 Nylon 6/6, 13% Glass-Fiber Reinforced, Dry As Molded
55 Ticona Celanese® Nylon 1403 Nylon 6/6, 13% Glass-Fiber Reinforced, at 50% RH
56 Ticona Celanese® Nylon 1500 Nylon 6/6, 33% Glass-Fiber Reinforced, Dry As Molded
57 Ticona Celanese® Nylon 1500 Nylon 6/6, 33% Glass-Fiber Reinforced, at 50% RH
58 Ticona Celanese® Nylon 1503 Nylon 6/6, 33% Glass-Fiber Reinforced, Dry As Molded
59 Ticona Celanese® Nylon 1503 Nylon 6/6, 33% Glass-Fiber Reinforced, at 50% RH
60 Ticona Celanese® 1500 FDA Nylon 6/6, 33% Glass-Fiber Reinforced, Dry As Molded
61 Ticona Celanese® 1500 FDA Nylon 6/6, 33% Glass-Fiber Reinforced, at 50% RH
62 Ticona Celanese® 1503 FDA Nylon 6/6, 33% Glass-Fiber Reinforced, Dry As Molded
63 Ticona Celanese® 1503 FDA Nylon 6/6, 33% Glass-Fiber Reinforced, at 50% RH
64 Ticona Celanese® Nylon 1600 Nylon 6/6, 40% Glass-Fiber Reinforced, Dry As Molded
65 Ticona Celanese® Nylon 1600 Nylon 6/6, 40% Glass-Fiber Reinforced, at 50% RH
66 Ticona Celanese® Nylon 1603 Nylon 6/6, 43% Glass-Fiber Reinforced, Dry As Molded
67 Ticona Celanese® Nylon 1603 Nylon 6/6, 43% Glass-Fiber Reinforced, at 50% RH
68 Ticona Celanese® 1600 FDA Nylon 6/6, 40% Glass-Fiber Reinforced, Dry As Molded
69 Ticona Celanese® 1600 FDA Nylon 6/6, 40% Glass-Fiber Reinforced, at 50% RH
70 Ticona Celanese® 1603 FDA Nylon 6/6, 43% Glass-Fiber Reinforced, Dry As Molded
71 Ticona Celanese® 1603 FDA Nylon 6/6, 43% Glass-Fiber Reinforced, at 50% RH
72 Ticona Celanese® Nylon 1700 Nylon 6/6, 25% Glass-Fiber Reinforced, Dry As Molded
73 Ticona Celanese® Nylon 1700 Nylon 6/6, 25% Glass-Fiber Reinforced, at 50% RH

74 Ticona Celanese® Nylon 1703 Nylon 6/6, 25% Glass-Fiber Reinforced, Dry As Molded
75 Ticona Celanese® Nylon 1703 Nylon 6/6, 25% Glass-Fiber Reinforced, at 50% RH
76 Ticona Celanese® 1700 FDA Nylon 6/6, 25% Glass-Fiber Reinforced, Dry As Molded
77 Ticona Celanese® 1700 FDA Nylon 6/6, 25% Glass-Fiber Reinforced, at 50% RH
78 Ticona Celanese® 1703 FDA Nylon 6/6, 25% Glass-Fiber Reinforced, Dry As Molded
79 Ticona Celanese® 1703 FDA Nylon 6/6, 25% Glass-Fiber Reinforced, at 50% RH
80 Ticona Celanese® Nylon 6020 Nylon 6/6, Dry As Molded
81 Ticona Celanese® Nylon 6020 Nylon 6/6, at 50% RH
82 Ticona Celanese® Nylon 6023 Nylon 6/6, Dry As Molded
83 Ticona Celanese® Nylon 6023 Nylon 6/6, at 50% RH
84 Ticona Celanese® Nylon 6030 Nylon 6/6, Dry As Molded
85 Ticona Celanese® Nylon 6030 Nylon 6/6, at 50% RH
86 Ticona Celanese® Nylon 6033 Nylon 6/6, Dry As Molded
87 Ticona Celanese® Nylon 6033 Nylon 6/6, at 50% RH
88 Ticona Celanese® Nylon 6420 Nylon 6/6, 14% Glass-Fiber Reinforced, Dry As Molded
89 Ticona Celanese® Nylon 6420 Nylon 6/6, 14% Glass-Fiber Reinforced, at 50% RH
90 Ticona Celanese® Nylon 6423 Nylon 6/6, 14% Glass-Fiber Reinforced, Dry As Molded
91 Ticona Celanese® Nylon 6423 Nylon 6/6, 14% Glass-Fiber Reinforced, at 50% RH
92 Ticona Celanese® Nylon 6520 Nylon 6/6, 33% Glass-Fiber Reinforced, Dry As Molded
93 Ticona Celanese® Nylon 6520 Nylon 6/6, 33% Glass-Fiber Reinforced, at 50% RH
94 Ticona Celanese® Nylon 6523 Nylon 6/6, 33% Glass-Fiber Reinforced, Dry As Molded
95 Ticona Celanese® Nylon 6523 Nylon 6/6, 33% Glass-Fiber Reinforced, at 50% RH
96 Ticona Celanese® Nylon 7020 Nylon 6/6, Dry As Molded
97 Ticona Celanese® Nylon 7020 Nylon 6/6, at 50% RH
98 Ticona Celanese® Nylon 7023 Nylon 6/6, Dry As Molded
99 Ticona Celanese® Nylon 7023 Nylon 6/6, at 50% RH
100 Ticona Celanese® Nylon 7420 Nylon 6/6, 13% Glass-Fiber Reinforced, Dry As Molded
101 Ticona Celanese® Nylon 7420 Nylon 6/6, 13% Glass-Fiber Reinforced, at 50% RH
102 Ticona Celanese® Nylon 7423 Nylon 6/6, 13% Glass-Fiber Reinforced, Dry As Molded
103 Ticona Celanese® Nylon 7423 Nylon 6/6, 13% Glass-Fiber Reinforced, at 50% RH
104 Ticona Celanese® Nylon 7520 Nylon 6/6, 33% Glass-Fiber Reinforced, Dry As Molded
105 Ticona Celanese® Nylon 7520 Nylon 6/6, 33% Glass-Fiber Reinforced, at 50% RH
106 Ticona Celanese® Nylon 7523 Nylon 6/6, 33% Glass-Fiber Reinforced, Dry As Molded
107 Ticona Celanese® Nylon 7523 Nylon 6/6, 33% Glass-Fiber Reinforced, at 50% RH
108 Ticona Fortron® 0203 B6 Polyphenylene Sulfide (PPS)
109 Ticona Fortron® 0205 B4 Polyphenylene Sulfide (PPS)
110 Ticona Fortron® 0214 B1 Polyphenylene Sulfide (PPS)
111 Ticona Fortron® 0320 B0 Polyphenylene Sulfide (PPS)
112 Ticona Fortron® 0205 P4 Polyphenylene Sulfide (PPS)
113 Ticona Fortron® 0214 P1 Polyphenylene Sulfide (PPS)
114 Ticona Fortron® 0320 P0 Polyphenylene Sulfide (PPS)
115 Ticona Fortron® 0205 C4 Polyphenylene Sulfide (PPS)
116 Ticona Fortron® 0214 C1 Polyphenylene Sulfide (PPS)
117 Ticona Fortron® 0320 C0 Polyphenylene Sulfide (PPS)
118 Ticona Fortron® 1130 L4 Polyphenylene Sulfide (PPS), 30% Glass Fiber
119 Ticona Fortron® 1140 A0 Polyphenylene Sulfide (PPS), 40% Glass Fiber
120 Ticona Fortron® 1140 L4 Polyphenylene Sulfide (PPS), 40% Glass Fiber
121 Ticona Fortron® 1140 L6 Polyphenylene Sulfide (PPS), 40% Glass Fiber

122 Ticona Fortron® 1140 L7 Polyphenylene Sulfide (PPS), 40% Glass Fiber
123 Ticona Fortron® 4184 L4 Polyphenylene Sulfide (PPS), Mineral/Glass-Fiber Filled
124 Ticona Fortron® 4184 L6 Polyphenylene Sulfide (PPS), Mineral/Glass-Fiber Filled
125 Ticona Fortron® 4665 B6 Polyphenylene Sulfide (PPS), Mineral/Glass-Fiber Filled
126 Ticona Fortron® 6165 A4 Polyphenylene Sulfide (PPS), 65% Mineral/Glass-Fiber
127 Ticona Fortron® 6165 A6 Polyphenylene Sulfide (PPS), 65% Mineral/Glass-Fiber
128 Ticona Fortron® 6850 L6 Polyphenylene Sulfide (PPS)
129 Ticona Celcon® M25 Acetal Copolymer
130 Ticona Celcon® M50 Acetal Copolymer
131 Ticona Celcon® M90™ Acetal Copolymer
132 Ticona Celcon® M140 Acetal Copolymer
133 Ticona Celcon® M270™ Acetal Copolymer
134 Ticona Celcon® M450 Acetal Copolymer
135 Ticona Celcon® GC25A Acetal Copolymer, 25% Glass-Coupled
136 Ticona Celcon® GB25 Acetal Copolymer, 25% Glass Bead Filled
137 Ticona Celcon® LW90 Acetal Copolymer
138 Ticona Celcon® LW90F2 Acetal Copolymer, PTFE Modified
139 Ticona Celcon® LW90S2 Acetal Copolymer, 2% Silicone Modified
140 Ticona Celcon® LWGCS2 Acetal Copolymer, 2% Silicone Modified
141 Ticona Celcon® MC90 Acetal Copolymer, Mineral Coupled
142 Ticona Celcon® MC90HM Acetal Copolymer, Mineral Coupled
143 Ticona Celcon® MC270 Acetal Copolymer, Mineral Coupled
144 Ticona Celcon® MC270HM Acetal Copolymer, Mineral Coupled
145 Ticona Celcon® UV25Z Acetal Copolymer
146 Ticona Celcon® M25UV Acetal Copolymer
147 Ticona Celcon® UV90Z Acetal Copolymer
148 Ticona Celcon® M90™UV Acetal Copolymer
149 Ticona Celcon® UV270Z Acetal Copolymer
150 Ticona Celcon® M270™UV Acetal Copolymer
151 Ticona Celcon® WR25Z Acetal Copolymer
152 Ticona Celcon® WR90Z Acetal Copolymer
153 Ticona Celcon® AS270 Acetal Copolymer
154 Ticona Celcon® AS450 Acetal Copolymer
155 Ticona Celcon® EC90PLUS Acetal Copolymer
156 Ticona Celcon® EF10 Acetal Copolymer, 10% Carbon Fiber
157 Ticona Celcon® TX90 Acetal Copolymer
158 Ticona Celcon® TX90PLUS Acetal Copolymer
159 Ticona Vandar® 2100 Thermoplastic Polyester Alloy
160 Ticona Vandar® 2500 Thermoplastic Polyester Alloy
161 Ticona Vandar® 4602Z Thermoplastic Polyester Alloy
162 Ticona Vandar® 6000 Thermoplastic Polyester Alloy
163 Ticona Vandar® 8000 Thermoplastic Polyester Alloy
164 Ticona Vandar® 8929 Thermoplastic Polyester Alloy
165 Ticona Vandar® 9056 Thermoplastic Polyester Alloy
166 Ticona Vandar® 9116 Thermoplastic Polyester Alloy
167 Ticona Vandar® 2122 Thermoplastic Polyester Alloy, 10% Mineral Filled
168 Ticona Vandar® 4612R Thermoplastic Polyester Alloy, 7% Glass-Fiber
169 Ticona Vandar® 4632Z Thermoplastic Polyester Alloy, 15% Glass-Fiber

170 Ticona Vandar® 4662Z Thermoplastic Polyester Alloy, 30% Glass-Fiber
171 Ticona Impet® 320R Recycled PET, 15% Glass Reinforced
172 Ticona Impet® 330R Recycled PET, 30% Glass Reinforced
173 Ticona Impet® 340R Recycled PET, 45% Glass Reinforced
174 Ticona Impet® 610R Recycled PET, 13% Glass/Mineral Reinforced
175 Ticona Impet® 630R Recycled PET, 35% Glass/Mineral Reinforced
176 Ticona Impet® 740 PET, 45% Glass/Mineral Reinforced
177 Ticona Impet® 830R Recycled PET, 35% Glass/Mineral Reinforced
178 Ticona Impet® 840R Recycled PET, 45% Glass/Mineral Reinforced
179 Ticona Vectra® A115 Liquid Crystal Polymer (LCP), 15% Glass Reinforced
180 Ticona Vectra® A130 Liquid Crystal Polymer (LCP), 30% Glass Reinforced
181 Ticona Vectra® A150 Liquid Crystal Polymer (LCP), 50% Glass Reinforced
182 Ticona Vectra® B130 Liquid Crystal Polymer (LCP), 30% Glass Reinforced
183 Ticona Vectra® C115 Liquid Crystal Polymer (LCP), 15% Glass Reinforced
184 Ticona Vectra® C130 Liquid Crystal Polymer (LCP), 30% Glass Reinforced
185 Ticona Vectra® C150 Liquid Crystal Polymer (LCP), 50% Glass Reinforced
186 Ticona Vectra® E130i Liquid Crystal Polymer (LCP), 30% Glass Reinforced
187 Ticona Vectra® K130 Liquid Crystal Polymer (LCP), 30% Glass Reinforced
188 Ticona Vectra® K140 Liquid Crystal Polymer (LCP), 40% Glass Reinforced
189 Ticona Vectra® L130 Liquid Crystal Polymer (LCP), 30% Glass Reinforced
190 Ticona Vectra® V140 Liquid Crystal Polymer (LCP), 40% Glass Reinforced
191 Ticona Vectra® A230 Liquid Crystal Polymer (LCP), 30% Carbon Fiber Reinforced
192 Ticona Vectra® A410 Liquid Crystal Polymer (LCP), 25% Glass/25% Mineral Filled
193 Ticona Vectra® A420 Liquid Crystal Polymer (LCP), Glass/Mineral/Graphite Filled
194 Ticona Vectra® A422 Liquid Crystal Polymer (LCP), Glass/Graphite Filled
195 Ticona Vectra® A430 Liquid Crystal Polymer (LCP), LCP/PTFE blend
196 Ticona Vectra® A435 Liquid Crystal Polymer (LCP), Glass/PTFE Filled
197 Ticona Vectra® A440 Liquid Crystal Polymer (LCP), Glass/PTFE Filled
198 Ticona Vectra® A515 Liquid Crystal Polymer (LCP), 15% Mineral Filled
199 Ticona Vectra® A530 Liquid Crystal Polymer (LCP), 30% Mineral Filled
200 Ticona Vectra® A540 Liquid Crystal Polymer (LCP), 40% Mineral Filled

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Search Results

The search phrase you entered, **Ticona**, is common to 207 materials, by searching on the term(s) **Ticona** in the n common text fields. Results are displayed up to a maximum of 200 materials per page. Follow the links below to v complete property information. If your material is not listed, please refer to our search help page for assistance in your search.

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BROADEN SEARCH

By clicking on the "Broaden" button, MatWeb will continue to search additional te for the exact word or phrase (including spacing and punctuation) that you entere Then, if there is more than one term, it will search text fields for occurrences of a terms in any order, and then finally it will search fields for occurrences of any of t terms in order, in an effort to provide you with the best result set possible.

	Material Name
201	Ticona Vectra® A625 Liquid Crystal Polymer (LCP), 25% Graphite Filled
202	Ticona Vectra® A700 Liquid Crystal Polymer (LCP), 30% Glass Reinforced
203	Ticona Vectra® B230 Liquid Crystal Polymer (LCP), 30% Carbon Fiber Reinforced
204	Ticona Vectra® C550 Liquid Crystal Polymer (LCP), 50% Mineral Filled
205	Ticona Riteflex® 640 Thermoplastic Polyester Elastomer (TPE)
206	Ticona Riteflex® 655 Thermoplastic Polyester Elastomer (TPE)
207	Ticona Riteflex® 677 Thermoplastic Polyester Elastomer (TPE)

Prev Page

Vectran HS LCP Fiber

Printer friendly version

Subcategory: Composite Fibers; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Material Notes:

Description: Vectran is a high-performance thermoplastic multifilament yarn spun from Vectran ® liquid crystal p commercially available melt spun LCP fiber in the world. Vectran fiber exhibits exceptional strength and rigidity. P times stronger than steel and ten times stronger than aluminum. These properties characterize Vectran: High stre resistance, high abrasion resistance, excellent flex/fold characteristics, minimal moisture absorption , excellent ch thermal expansion (CTE), high dielectric strength, outstanding cut resistance, excellent property retention at high/ vibration damping characteristics, high impact resistance.

Applications: Ropes and cables, electronics, recreations, aerospace, composites, military, industrial

Chemical Resistance: Hydrolytically stable. Resistant to organic solvents. Stable to acids (<90% conc.). Stable t

Data provided by Celanese Acetate LLC.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	Metric	English	
Density	1.4 g/cc	0.0506 lb/in³	
Moisture Absorption at Equilibrium	Max 0.1 %	Max 0.1 %	
Mechanical Properties			
Tensile Strength, Ultimate	2840 - 3210 MPa	412000 - 465000 psi	10 in. gauge length, 10
Elongation at Break	3.3 - 3.7 %	3.3 - 3.7 %	10 in. gauge length, 10
Tensile Modulus	64.8 - 72.4 GPa	9400 - 10500 ksi	10 in. gauge length, 10
Electrical Properties			
Dielectric Constant	3.3	3.3	
Thermal Properties			

Melting Point	330 °C	626 °F

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistant format. User: engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the origi calculations to minimize rounding error. We also ask that you refer to MatWeb's disclaimer and terms of use regarding this information. Click here to view all the pro originally entered into MatWeb.

Vectran M LCP Fiber

Subcategory: Composite Fibers; Liquid Crystal Polymer (LCP); Polymer; Thermoplastic

Material Notes:
Description: Vectran is a high-performance thermoplastic multifilament yarn spun from Vectran ® liquid crystal p commercially available melt spun LCP fiber in the world. Vectran fiber exhibits exceptional strength and rigidity. P times stronger than steel and ten times stronger than aluminum. These properties characterize Vectran: High stre resistance, high abrasion resistance, excellent flex/fold characteristics, minimal moisture absorption , excellent ch thermal expansion (CTE), high dielectric strength, outstanding cut resistance, excellent property retention at high/ vibration damping characteristics, high impact resistance.

Applications: Ropes and cables, electronics, recreations, aerospace, composites, military, industrial

Chemical Resistance: Hydrolytically stable. Resistant to organic solvents. Stable to acids (<90% conc.). Stable t

Data provided by Celanese Acetate LLC.

No vendors are listed for this material. Please **click here** if you are a supplier and would like informatio this material.

Physical Properties	Metric	English	
Density	1.4 g/cc	0.0506 lb/in³	
Moisture Absorption at Equilibrium	Max 0.1 %	Max 0.1 %	
Mechanical Properties			
Tensile Strength, Ultimate	1110 MPa	161000 psi	10 in. gauge length, 10
Elongation at Break	2 %	2 %	10 in. gauge length, 10
Tensile Modulus	52.4 GPa	7600 ksi	10 in. gauge length, 10
Electrical Properties			
Dielectric Constant	3.3	3.3	
Thermal Properties			

Melting Point	276 °C	529 °F

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistant format. User: engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the origi calculations to minimize rounding error. We also ask that you refer to MatWeb's disclaimer and terms of use regarding this information. Click here to view all the pro originally entered into MatWeb.